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THE LANCET

A Journal of British and Foreign Medicine, Surgery, Obstetrics, Physiology, Chemistry, Pharmacology, Public Health, and News.

IN TWO VOLUMES ANNUALLY.

VOL. CCXVIII.

VOL. I. FOR 1930.

ONE HUNDRED AND EIGHTH YEAR.

EDITED BY

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LONDON

PUBLISHED BY THE PROPRIETORS, THE LANCET LIMITED, NO. 7, ADAM STREET, ADELPHI, W.C., IN THE COUNTY OF LONDON, AND PRINTED BY HAZELL, WATSON & VINEY, LTD., 52, LONG ACRE, W.C.2.

MCMXXX.

REFERENCES AND ABBREVIATIONS

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CONCORDANCE

To enable the reader to determine at a glance the date and serial number of the issue of THE LANCET containing the required page reference.

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PUBLISHED BY THE PROPRIETORS, THE LANCET LIMITED, No. 7, Adam Street, Adelphi, W.C., in the County of London, and printed by HAZELL, WATSON & VINEY, LTD., 52, Long Acre, W.C. 2.

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Milroy Lectures

ON THE

INCIDENCE OF RHEUMATIC DISEASES.

Delivered before the Royal College of Physicians of London

BY J. ALISON GLOVER, O.B.E., M.D. CAMB., M.R.C.P. LOND., D.P.H.,

A MEDICAL OFFICER OF THE MINISTRY OF HEALTH.

LECTURE III.—THE INCIDENCE OF CHRONIC ARTHRITIS.*

(Delivered on March 6th.)

CHRONIC arthritis is in truth as old as the hills, for its effects have been recognised by Moodie [1] in the fossil skeletons of giant reptiles of the cretaceous age, whilst long after this the cave bear and the sabre-toothed tiger seem to have been especially subject to it, and it is still seen commonly in many lower animals. Nor in man is it any new disease; it was as prevalent in the prehistoric dwellers of Nubia and Upper Egypt [2] as amongst our Saxon forefathers of the heptarchy of whom Prof. F. G. Parsons [3] has told us, from the exploration of Saxon burial sites at Margate, Mitcham, and Bidford-on-Avon, that they suffered terribly from osteo-arthritis. Coming to more modern times Sydenham describes a chronic form of rheumatism lasting as long as life. Milton [4] regards it as one of the worst of human ills. Of recent years, national insurance has shown its incidence to be of great importance.

The Registrar-General, using the international list of causes of death, classifies *deaths* from chronic rheumatic diseases under the heading 52, which is divided into three sub-headings: (1) chronic rheumatism, (2) rheumatoid and osteo-arthritis, (3) gout.

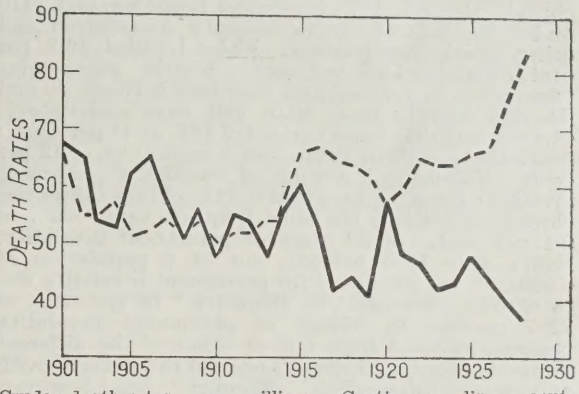
The incidence, as shown by mortality statistics, must be regarded with due consideration to the fact that many of the sufferers are cut off by intercurrent diseases, but this fact is to some extent compensated for by the method used by the Registrar-General in the classification of deaths. By their being placed in Group IV. of the general diseases, a measure of preference is accorded to chronic rheumatism, osteo-arthritis, and gout, and so, under the present method of working, they are preferred to almost any local disease recorded on the same certificate. This practice tends to the completeness of the death returns in respect of chronic arthritis.

Before 1921, deaths from "chronic arthritis" were included under the heading "diseases of the joints" (156), and from 1921 to 1926 inclusive under the heading "chronic rheumatism" (52 : 1). They are now included under "rheumatoid and osteo-arthritis" (52 : 2). These changes have, however, not produced much effect; the diagnosis "chronic arthritis" seems to have been much less often used in death certification than chronic rheumatism or rheumatoid and osteo-arthritis. The total number of deaths recorded under category 52 in 1928 was 3318, of which 2774 (84 per cent.) were ascribed to rheumatoid and osteo-arthritis, 214 (6 per cent.) to chronic rheumatism, and 330 (10 per cent.) to gout.

The rise in the deaths ascribed to rheumatoid arthritis and osteo-arthritis is considerable; thus since 1918 the male deaths have risen from 382 to 735, in 1928 the female from 1129 to 1969—and both sexes from 1511 to 2774, an increase of 84 per cent. The category originated in 1901 as "rheumatic arthritis, rheumatic gout" and 848 deaths previously allotted to "other constitutional diseases" were transferred to it. The deaths ascribed to gout declined to 179 in 1923, since when they have risen to 330 in 1928, which is also an increase of 84 per cent.—an unexpected fact in view of the general impression that gout is a rapidly declining disease.

Probably, however, the increase in deaths due to rheumatoid and osteo-arthritis and to gout, though partly due to the older age-distribution of the population

FIG. 1.



Crude death-rates per million. Continuous line = acute rheumatism. Interrupted line = chronic rheumatism, rheumatoid arthritis and osteoarthritis, and gout.

and partly to the preferential selection in the Registrar-General's Office before mentioned, mainly comes from an increased accuracy of diagnosis, due to the increased attention that the chronic joint changes and their classification have received. The crude annual death-rates per million living show corresponding increases—rheumatoid and osteo-arthritis rising from 27 for males, 57 for females, and 44 for persons in 1918 (civil population) to 43 for males, 96 for females, and 70 for persons in 1928. The female death-rate from this group is thus twice as high as the male. More than twice as many deaths are now ascribed to the various forms of chronic rheumatism together than are ascribed to rheumatic fever (apart from heart diseases) and the whole category accounts for about 0·7 per cent. of deaths at all ages, and 1·013 per cent. of deaths taking ages above middle life (45 years) (Fig. 1).

CHRONIC ARTHRITIS IN HOSPITAL PRACTICE.

The small proportion of deaths ascribed to chronic arthritis in the death returns is, however, much larger than the proportion of all *hospital admissions* due to it. In four large London General Hospitals the proportions were as follows: Guy's (1920) 0·5 per cent. of all in-patients, 1·9 per cent. of medical in-patients; St. Thomas's (1925) 0·3 per cent. of all in-patients; St. George's (1926) 0·2 per cent. of all in-patients; Royal Free (1928) 0·2 per cent. of all in-patients, 1·7 per cent. of medical in-patients. Even in special orthopædic hospitals the admissions of chronic arthritis are very small—probably about 3 per cent.—and even in poor-law hospitals, where one would expect a higher percentage, it was found that only 1·8 per cent. of both sexes and 2·3 per cent. of females admitted for chronic arthritis. It is only in the spa hospitals, where some 40 per cent. of the patients are admitted on account of chronic arthritis, that any impression of the heavy incidence of chronic arthritis can be obtained from hospital admissions. As regards out-patients chronic arthritis cases amount to about 0·2 per cent. of all out-patients seen at general hospitals in London, although at the special massage and physiotherapeutic departments they form about 10 per cent. of the cases seen. At the special clinics for physiotherapy, the proportion of chronic arthritis rises to 15 per cent. at the Kensington British Red Cross Clinic, and 26 per cent. at the Edgar Allen Institute, Sheffield.

I have little information as regards foreign hospitals, but I have been informed that at the Mayo Clinic

* Lectures I. and II. appeared in THE LANCET of March 8th and 22nd respectively.

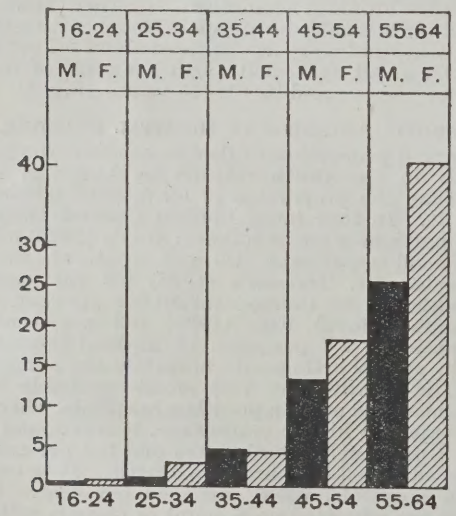
patients with chronic arthritis form some 7 per cent. of the total treated. Kroner [5] states that of a total of 3250 in-patients in the Municipal Hospital, Berlin, which correspond roughly to our poor-law infirmaries, 7 per cent. suffered from chronic arthritis.

A study of chronic disease in Boston was begun on June 1st, 1927, by the Boston Council of Social Agencies.[6] A survey was made of 4316 chronic and incurable patients reported by Boston hospitals or social agencies, 1863 of whom were in hospitals for chronic diseases, 1043 in general hospitals, and 1410 under the care of the Community Association and other social organisations. Males totalled 46·2 per cent.; females 53·8 per cent. Nearly one-quarter were under 30 years of age, one-third between 30 and 60, and slightly more than half were ambulatory. Chronic arthritis cases numbered 467, or 11 per cent.; heart disease 845, or 19 per cent.; cancer 534, or 12 per cent. Kahlmeter,[7] writing of Swedish Government invalidity pensions, says that next to old age infirmities chronic arthritis is the most frequent cause—i.e., in 9·1 per cent.—of all cases of permanent invalidity. Every year 1500 persons, out of a population of 6,000,000, are pensioned for permanent invalidity due to chronic arthritis. In Denmark [8] 14 per cent. of 7297 persons in receipt of permanent invalidity pensions suffered from one or other of the different forms of chronic arthritis, as against 13·5 per cent. with pulmonary tuberculosis. Zimmer [9] has, however, shown that in Berlin a tuberculous patient has 13·4 per cent. the chances of in-patient hospital treatment that a rheumatic patient has.

Insurance Statistics.

Fig. 4 of my second lecture showed the attack-rates for each age group of chronic arthritis as a whole contrasted with those of fibrositis, and of acute rheumatism. Fig. 2 of the present lecture contrasts the attack-rates for each sex of all forms of chronic arthritis combined, whilst Fig. 3 shows the attack-rates for each form of chronic arthritis separately, and has many points of interest. The first—which

Fig. 2.



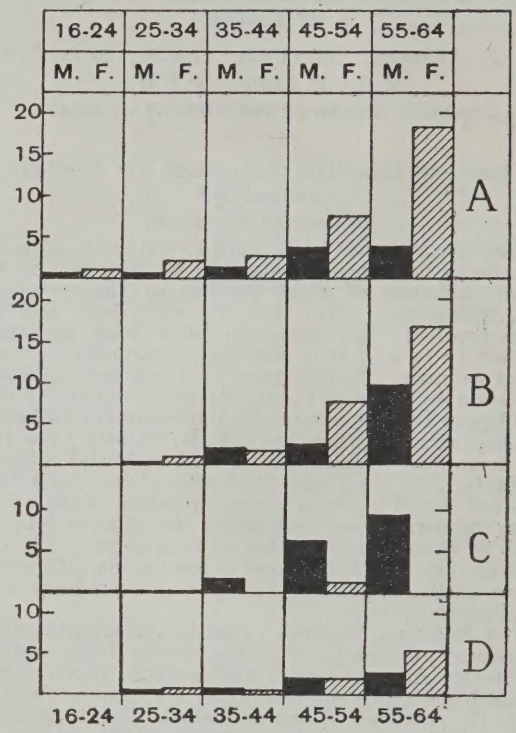
Incidence per thousand insured persons of each sex at each group (England and Wales). Chronic arthritis, all forms.

I mentioned in my last lecture—is the increase in all diseases as age advances; the second, the suddenness of the rise at middle age (45). The third is the greater rates for females in every disease, except gout and in every age-group except in the group 35–44 in osteo-arthritis, and in the same group for all forms of arthritis. The fourth point is the almost complete absence of gout in insured women, gout being fifty times as common in insured men as in insured women.

It may be noted that this chart proves the lasting truth of the aphorism of Hippocrates [10] that "a woman does not take the gout unless her menses be stopped."

As the greater incidence-rates fall upon the older age-periods in which there are fewer workers, the results for all ages are not so bad as the very high rates in the over middle age periods would suggest. Allowing for the age-distribution of the insured

Fig. 3.



Incidence per thousand insured persons of each sex at each age-group. A = rheumatoid arthritis. B = osteoarthritis. C = gout. D = unclassified.

population, we may estimate that in any thousand insured males of all ages there will be found one case of rheumatoid arthritis, three cases of osteo-arthritis, three cases of gout, and one case of unclassifiable arthritis. In any thousand insured females of all ages, on the other hand, we shall expect (owing to the fact that insured females have a much younger age-distribution than insured males) three cases of rheumatoid arthritis and two of osteo-arthritis, gout being absent.

There were probably in the whole insured population in 1922 some 90,000 patients whose chronic arthritis was sufficient to make them seek medical advice for it during the year. In some 40,000 of these cases the disease would be severe, in 25,000 of moderate severity, in 25,000 but slight or early. These estimates, of course, omit the much larger number of cases of chronic arthritis occurring in uninsured females. Probably, too, if the sample were a fair one, the approved societies were paying to their members for that year sick or disablement pay for invalidity caused by chronic arthritis amounting to nearly £1,000,000, in something like these proportions—namely, for rheumatoid arthritis about £381,000, for osteo-arthritis about £389,000, for gout £145,000, and for unclassifiable chronic arthritis about £82,000.

Considerable as these attack-rates for osteo-arthritis may appear we must be prepared to enlarge our ideas about the incidence of osteo-arthritis still further if some modern views of fibrositis are accepted. The work of Putti and Sicard, for example, has largely modified continental opinion with regard to sciatica. Putti [11] is convinced that idiopathic sciatica takes origin in spinal arthritis, "that sciatica is a neuralgia

caused by pathological conditions of the intervertebral foramina and especially of the intervertebral articulations. In other words, sciatica is a symptom of neurodocitis and lumbarthritis. The terms rheumatic sciatica and idiopathic sciatica should be substituted by the more precise and adequate one of arthritic or vertebral sciatica. To treat the sciatica it is necessary to treat the arthritis."

Allard [12] has recently stated that in America in the industrial cases of backache causing absence from work for more than three months, 80 per cent. will be found to be due to hypertrophic arthritis.

Diatheses and Sex-incidence.

"The arthritic diathesis," says Llewellyn,[13] "was certainly one of the first so-called diatheses laid down by our predecessors" and from early times most authorities have inclined to the opinion that *heredity* plays a considerable part in the incidence of chronic arthritis—a part most strongly evidenced in gout; next, perhaps, in rheumatoid arthritis; but still strongly played in osteo-arthritis, which, like old age and all its attributes, tends to run in families. Pemberton [14] found a strong family history in 58 per cent. of his patients, and considers that in certain families, especially those of asthenic or enteroptotic build, in whom one or two members had had arthritis, the occurrence in other members could be predicted almost certainly, especially at or after middle life. Strangeways found this strong family history in almost exactly the same proportion as Pemberton, and in the Ministry's inquiry[15] in female patients with rheumatoid arthritis it was found in 48 per cent.

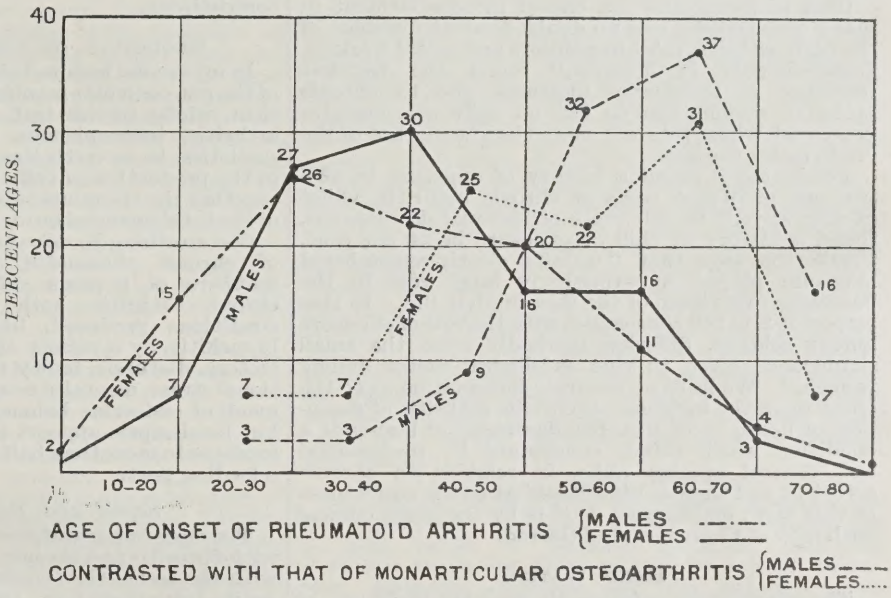
One might have thought Pemberton's families of asthenic or enteroptotic build would have been as likely to develop tuberculosis as rheumatoid arthritis, and it is strange to find, on the one hand, observers who say that persons with this arthritic diathesis are curiously free from any tendency to pulmonary tuberculosis; Lawrason Brown,[16] for example, quoted by Pemberton, found only 11 cases of arthritis in 4500 cases of pulmonary tuberculosis. On the other hand, on the Continent one form of rheumatoid arthritis (Poncet's) is held to be due to a concealed focus of tuberculosis, such as a mediastinal gland.

In few diseases has *sex* a more pronounced influence than in arthritis. Females are much more susceptible to rheumatoid arthritis than males—thrice as susceptible according to Strangeways, five times Llewellyn, and six times Bannatyne; concerning osteo-arthritis opinion is more divided. R. Stockman took the view that it is much more common in men than in women, but other observers speak in less certain terms, and in the Ministry of Health inquiry [17] the attack-rates for osteo-arthritis were found to be considerably higher for insured females than for insured men at every age above 45. Much will depend upon whether the observer classifies certain forms of climacteric arthritis as osteo-arthritis. Monarticular osteo-arthritis [18] of the hip is much more common in men than in women; thus, it formed 8 per cent. of 149 male cases of osteo-arthritis in the Ministry's practitioners' inquiry in 1922, and 9 per cent. of 640 male cases of osteo-arthritis recorded by regional medical officers in the same year, whilst in female cases of osteo-arthritis it formed respectively only 1 per cent. in 71 cases and 2 per cent. in 633 cases.

This sex inequality of incidence of malum coxæ senilis is interesting when we recall that sciatica shows a similar sex inequality, being at least four times as common in men, whilst lumbago is thrice as common in men.

Monarticular osteo-arthritis affecting one knee or one shoulder, on the other hand, form similar percentages of all cases of osteo-arthritis in each sex—about 9 per cent. of all cases of osteo-arthritis being cases in which one knee only is affected, and about 7 per cent. being cases in which the disease is confined entirely to one shoulder, whether the series of cases be males or females. Gout is perhaps of all diseases which can afflict both sexes the most exclusively masculine, and is perhaps 25 times as common in men as in women (my previous proportion relating only to insured women). But in dealing with all forms of chronic arthritis together, and in such problems as provision of treatment, it will be well to estimate that there will be twice as many female patients as male.

Fig. 4.



Shown by the percentages of patients in each age-group.

The diagrams I have shown of attack-rates in various age-groups illustrate the effect of *age* upon incidence. Cases of rheumatoid arthritis may begin at 18 months or at 87 years [19] but its onset is most commonly between 30 or 40 years—that is, a decade or a decade and a half before the usual age of onset of osteo-arthritis or gout [20] as shown in Fig. 4. An earlier onset in rheumatoid arthritis than 30 is usually of serious prognostic import.

Occupation and Chill.

Occupation has undoubtedly much influence upon the incidence of chronic arthritis, although its effects are as yet imperfectly understood. W. A. Lane has emphasised the influence of certain occupations in producing a condition, not so much the result of disease, but rather the result of a series of compensatory changes occurring in one or more joints in response to altered stress. J. van Breemen regards occupation as a determining factor in the production of arthritis, every special trade putting its mark upon what he calls the "rheumatic deviation." The joints most in use in the particular occupation generally show arthritic changes first, most, and longest; in his view

every occupation has its own distinctive "rheumatism." Such occupations as sewing and knitting seem specially conducive to rheumatoid arthritis, but there are obvious fallacies in connexion with such industries. The nursing of sick relatives, Strangeways showed, is an occupation peculiarly apt to lead to rheumatoid arthritis.

Toxic factors must be specially mentioned; painters, for example, from their liability to lead poisoning are specially subject to gout, to osteo-arthritis, and possibly also to rheumatoid arthritis. Eleven per cent. of male patients with gout had a history of occupations involving close contact with lead in the Ministry's inquiry compared with 5 per cent. in the other forms of arthritis and in sciatica, and 2 or 3 per cent. in the other rheumatic diseases. The one outstanding feature in the Ministry's inquiry was the heavy incidence of osteo-arthritis upon metal workers, who, whilst having about their "expected" number of cases of rheumatoid arthritis and of gout, had more than double the "expected" number of osteo-arthritis (and also of sciatica, a disease which is often associated with it).

Chill and exposure are causal factors incident in many occupations, and no doubt account for some of the high arthritis rates in painters and metal workers. Danieschewski, in Moscow,[21] found the heaviest incidence of temporary unfitness due to chronic articular rheumatism to fall on railway locomotive personnel, whose rate was more than twice that of the crude metal workers.

Pemberton [22] found a history of exposure in 42·8 per cent. of 70 male cases of chronic arthritis, whilst Strangeways,[19] in 200 cases of rheumatoid arthritis, found a history of chill or exposure in 24 per cent. Pemberton says that "definite clearly-remembered exposure played a surprisingly large rôle in the conscious experience of the men in civil life. In this respect it is in full consonance with the rôle of exposure among soldiers, differing markedly from the small significance given to this ætiological factor among women." We have no accurate information as to the effect upon the incidence of chronic arthritis of *dampness* of house or of site, but dampness of houses is a condition which stands condemned by professional and general opinion alike, in relation to chronic arthritis, and there is little doubt as to the correctness of this view, emphasised as it is by the great clinical authority of Charcot and of Garrod.

Hard Water.

The effect of the *water-supply* upon the incidence of arthritis is a question often asked by correspondents writing to the Ministry, for there is a tendency to consider that hardness in a water-supply might increase the incidence of chronic arthritis, or that it might exacerbate the symptoms in a patient already suffering from the disease. As regards the first, there is no evidence, whilst the prevalence of osteo-arthritis in the great towns of South Lancashire which have soft water-supplies is well known. With regard to gout in the Ministry's inquiry [23] there was no apparent correlation between the hardness of the water-supply and the incidence, Birmingham, for example, with a soft water having a gout incidence much greater than that of Norwich with a hard water. Sir Alexander Houston [24] says "of not unreasonably hard waters, the evidence in favour of their harmful properties is largely, if not wholly, fanciful . . . . the consensus of medical opinion favours the moderate view that, within reasonable limits, the hardness of a water is a matter of small importance." P. G. Lewis,[25] speaking of waters of temporary hardness in relation to health generally, stated that there is no evidence that hard water has any bad effect; on the contrary, all the evidence is the other way. French and Austrian commissions have arrived at similar conclusions. The drinking water of many of our health resorts is hard.

The matter may be summarised thus, that there is no apparent correlation between the hardness of water and the incidence or severity of chronic arthritis, although patients sometimes complain that their arthritic pains are made worse by drinking hard water.

The *geographical incidence* in the Ministry's inquiry seemed to point to osteo-arthritis, together with its frequent associate lumbago and sciatica, being unusually prevalent in the industrial practices of South Lancashire. Osteo-arthritis has been nicknamed the Manchester disease. Gout was strikingly in excess in the south of England, and remarkably scarce in the north-east division, but its local incidence varied greatly, the male attack-rate in Birmingham being nearly seven times that in Sheffield. I have long desired to investigate the local incidence of gout. With regard to foreign countries French physicians seem convinced that there is less chronic arthritis there than in England, though relatively to other forms the Poncet type of arthritis is perhaps more common. Chronic arthritis seems to be as common in the north-eastern States of America, in Germany, in Holland, and in the Scandinavian countries as in England. Danieschewski's [21] work suggests that it is more common in Russia. But the absence of a working classification for international use has so far prevented any valid comparisons.

Reduction of Chronic Rheumatism.

In my second lecture I showed the immense incidence of the non-articular manifestations of chronic rheumatism, whilst in this last I have shown that chronic arthritis, inconspicuous in mortality and hospital statistics, is, nevertheless, one of the greatest factors in the production of suffering and invalidity, and that together the rheumatic diseases cost fully one-seventh of the total financial burden of industrial sickness.

Can anything be done to reduce this great incidence of chronic rheumatic disease? Here are great numbers of persons suffering from fibrositis and chronic arthritis, both of which are pathological conditions produced, like, say, food poisoning or bronchitis, by a variety of agents or causes. Of these factors, diathesis, faulty metabolism, trauma, occupational stress, mental stress, senile change, and derangement of endocrine balance seem all to be important, but focal sepsis appears to be the chief, and there is evidence in more than half of all cases that it has played a leading part.

Sepsis and Dental Prophylaxis.

The more important sites of focal infection associated with fibrositis and chronic arthritis are those connected with the teeth, the tonsils, the accessory sinuses, the genito-urinary system, and the bowel, the two first mentioned being by far the most common. The organism most frequently incriminated is the non-hæmolytic *Streptococcus viridans*.

The identification of the infecting focus is often difficult, but there can be little doubt that the prevention of dental sepsis should be one of our first objectives if we are to reduce the incidence of the chronic rheumatic diseases. The school medical service is improving the condition of our children's teeth and the approved societies are spending great sums on dental benefit, but although all this and more is necessary, yet for success it seems we must go farther back, and follow that more excellent way indicated in the researches of Prof. and Mrs. Mellanby.[26] If their work applies, as seems likely, to the child as much as to the puppy, it follows that not only must the growing child have a sufficient diet containing vitamin D, but that proper maternal feeding with a diet containing the same vitamin is essential while the child is yet unborn if he is to produce not only perfect deciduous but also perfect permanent teeth. Unfortunately the staple diet of the working classes consists largely of articles deficient in vitamin D, and some otherwise admirable foods, such as oatmeal, seem to have a deleterious effect on the calcification of teeth.

We must revise all our ideas, for it seems clear that the most rigid adherence to the accepted rules of dental hygiene constitutes little safeguard against caries, though those of us who have had the misfortune to be born and to have acquired our defective

teeth before these investigations, probably would do well to continue it. For the next stage in the investigation we must look to our colleagues in charge of antenatal clinics, but education, oral hygiene, detergent dietary, regular inspection and treatment of the teeth are still urgently necessary.

It is too soon to know whether the wholesale tonsillectomy seen of recent years, especially in the wealthier classes (50 per cent. in most of our great public schools), will produce greater freedom from chronic rheumatism.

Environmental and Personal Hygiene.

The importance of the prevention of dampness in the sites of dwellings, and in the dwellings themselves, and the importance of the free circulation of air and of sunlight about dwellings is great in the prevention of arthritis. Dampness in a dwelling is an unmixed evil to the health of the inmates. The provision of pithead and works baths, and the proper first-aid treatment of minor sepsis, are perhaps only slightly less important in the prevention of arthritis than in the prevention of fibrositis. The improved protection given to many water-supplies against plumbosolvency may be a factor in the reduction of the incidence of gout, whilst the increasing sobriety of all classes and the scantier and more vegetarian diet of middle aged persons in sedentary occupations are features of modern life which should tend to diminish both gout and some other forms of chronic arthritis. The increased attention given to maintaining the muscular tone and the skin reaction of the individual in bathing, sun bathing, games, sports, exercises—particularly those in the open air—are of the utmost importance in increasing the resistance to the disease, and in counteracting the evil effects either of sedentary occupation, or the special stress of occupational trauma. Then, too, are important the prophylactic effects of correct posture, and the prevention of postural and static deformities, scoliosis, and flat-feet. In Boston, Goldthwait and Osgood, in addition to other measures, employ general corrective exercises with great advantage in the treatment of chronic arthritis. Dr. A. R. Neligan tells me "it was striking to see badly crippled arthritics with abdominal and chest movements and muscles properly developed and diaphragms taking their full share in the activation of the circulation, as the result of this training, fighting their way back to health." We must keep supple, "Not tied or manacled with joint or limb," says Milton "and obstacle find none, of membrane, joint, or limb." Crepitation or grating in a joint matters little so long as it works freely and painlessly. Function is the important thing. The disordered function is the disease.

TREATMENT.

Even with so chronic a disease as arthritis the first essential of success in treatment is an early diagnosis, based on a complete investigation of the possible causes—what is the type of the arthritis and is there an infective focus?

The determination of the type of arthritis may profoundly affect the treatment, but cannot in any case lessen the need for the most careful search for an infecting focus. For example, suppose the diagnosis is gout—the most undoubtedly metabolic disease of the group—the second duty, the search for the infecting focus, is as clamant as ever, for, in a large proportion of cases of gout, an infective focus plays an important rôle in activating the metabolic process, and so precipitating attacks.

If an infective focus be found it should be removed or treated at the first possible opportunity. However much importance we may attach to metabolic, endocrine, or other factors in the causation of chronic arthritis, if we attempt to treat the disease in the joints in the presence of an unreduced focus of infection our attack will almost assuredly fail. Time in the treatment of chronic arthritis is almost everything. Cecil and Adams,[22] in 612 cases, found that 82 per cent. of patients treated in the first six months of the disease either recovered completely or were greatly improved. The percentage of favourable results decreased with each year, so that patients whose symptoms had persisted for five years or more before coming to the clinic rarely received very marked benefit from any form of treatment.

The complete investigation of the possible causes of arthritis may be a long and difficult matter, requiring a regular "team" of specialists. Once discovered, the removal of a focus may be equally a matter for the utmost care. For all this elaborate diagnostic investigation, and for the treatment and removal of the foci found, to be undertaken under the most favourable conditions, an "arthritis unit" seems to be almost indispensable.

This should be an in-patient institution or a department of an existing in-patient hospital working in close coöperation with either a university or a large teaching school of medicine to enable it to fulfil the purpose of research teaching and observation as well as of treatment. Here patients would come at the earliest stage of their disease for thorough examination by modern methods, for diagnosis, and for record; here the focus of infection would be sought, and, if possible, found and removed; here the necessary bacteriological, biochemical, and radiographical work could be completed before the patient was passed on to the spa hospital, or to the physical treatment centre, or to his own doctor for domiciliary treatment, or to complete his cure; here orthopædic surgery, or the fitting of the more elaborate appliances occasionally necessary in advanced cases, would be performed.

Neither the general hospitals, overburdened as they are with acute cases, nor the general practitioners have the time or the equipment to deal with these long cases of chronic arthritis. This is no reflection upon the practitioner. No man can in himself constitute a "team," he cannot be dentist, bacteriologist, radiologist, throat surgeon, and hydrologist in one person. At present only a small minority of the patients are subjected to that thorough diagnostic search which should precede any treatment for chronic arthritis, and only an equally small fraction, usually of the wealthier classes, are able to secure in full measure those forms of treatment, especially the physical therapy, they need.

Centres for Physical Treatment.

No scheme of treatment for chronic arthritis can be considered complete unless it provides for a large range of physical methods, including electrical treatment, diathermy, radiant heat, ionisation, massage, exercises, and the various forms of hydrological treatment. This last, if not essential, is an invaluable adjunct for the resorption of inflammatory products, for the relief of pain, for rendering stiffened tissues supple, for the restoration of lost function in the joints and lost reaction in the skin, and for the re-education of wasted muscle. Whilst hydrological treatment is perhaps best given as spa treatment with the advantages of change of air and regimen, and the specific therapeutic qualities of the natural mineral waters of the spa, it can be given with great benefit to patients at out-patient clinics. Physical and hydrological treatment involve special experience, specially trained staff, and special equipment, and these can only be secured economically if the treatment, as far as out-patients are concerned, be given in physical treatment centres equipped to deal with large numbers of patients.

Such physical treatment centres should also be arranged to act as clearing houses, directing patients as to the form of treatment particularly suited to their special need and the place where it may be obtained. Some cases need the removal of a focus of infection, some the intensive study of an arthritis unit, others are suitable for treatment at a spa or spa hospital, whilst others would be greatly benefited by regular out-patient treatment at the centre. These centres should be organised in closest liaison with the "arthritis unit" and with the spa hospitals, and should provide the continued supervision, observation, and necessary after-care, including education in simple remedial movements, which should follow in-patient institu-

tional treatment. Such centres would be of the greatest service in many conditions other than arthritis, fractures and injuries, deformities, fibrositis, and diseases of the nervous system.

Last week was a memorable one in the history of the treatment of chronic arthritis, for it saw the opening by the Queen of the new Regent's Park Physical Treatment Centre for Rheumatic Diseases provided by the activity of the British Red Cross Society and the munificence of Sir Otto Beit and others. Without disparagement of several smaller existing clinics which are doing wholly admirable work in Kensington, Sheffield, and elsewhere, I may describe this new centre, capable of dealing with 400 patients a day, as the prototype of the new order. Unfortunately, no "arthritis unit" has yet come into being, and so far this institution remains a vision of the future.

Spa Treatment.

The *spa hospitals* of this country treat over 2500 cases of chronic arthritis each year, which form some 40 per cent. of all their cases admitted. They do an invaluable work now, but would do even better by proper coördination with arthritis units and physical treatment centres, for at present many of their 650 beds are occupied by patients whose disease is too advanced to permit of full benefit, and despite rules to the contrary, many patients come for spa treatment with unremoved focal sepsis. A wise selection of cases would be invaluable to the efficiency of the spa hospital. The patients having been thoroughly examined, and the preliminary treatment being completed at the arthritis unit, spa treatment would be more efficient and the chances of the spa physician to cure rather than to alleviate the condition of his arthritis patients greatly increased. Liaison with physical treatment centres would also enable a proper follow-up system to be introduced so that patients after leaving the spa hospital could be kept under periodic observation, and receive out-patient treatment when necessary.

In view of the heavy incidence of the chronic rheumatic diseases and their immense cost, the provision and support of all three types of institutions could scarcely fail to repay any reasonable expenditure upon them.

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CEREBRO-SPINAL METASTASES FROM UNSUSPECTED PULMONARY CARCINOMA.

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UNTIL comparatively recently, primary carcinoma of the lung has been regarded as a somewhat rare disease. In 1903 Rolleston and Trevor [1] found only eight cases of intrathoracic malignant disease in 3983 autopsies extending over a period of 12 years. Investigations in this country, in America, and on the Continent during the past 10 to 15 years have revealed the fact that this disease is now much more frequent. During the period 1889–99 at the Eppendorfer Krankenhaus, Hamburg, Kikuth [2] states that there were only 10 primary cancers of the lung, whereas from 1912–23 there were 146 cases (the annual number of necropsies was doubled in the period 1889–1923). Primary carcinoma of the lung now probably constitutes about 4 per cent. of all carcinomata.

The problem naturally arises as to whether this increase is real or only apparent. Simpson [3] has paid special attention to this point and concludes, after eliminating alterations in pathological conception and improvements in clinical diagnosis, that the increase in incidence is a real one. Many suggestions are forthcoming to account for this increase, but none of them is entirely satisfactory or free from criticism. It might be due to improvement in diagnosis, associated with recent advances in radiography and bronchoscopy, and to the attention which has been focused on the subject by the careful work of Barnard on the pathological nature of intrathoracic neoplasms. Fried [4] has also suggested that influenza, recently present on several occasions in almost pandemic form, has been the direct cause of a metaplasia of the pulmonary epithelium leading to the development of a neoplasm. Other views are that the increase is due to the inhalation of some foreign material from the atmosphere (Duguid [5]), to "tar-spraying" of the roads or to the pollution of the air by exhaust gases from motor-driven vehicles.

Along with the increase in the primary lesion, one would expect an increase in the occurrence of secondary deposits, and the present investigation arose from the admission to the National Hospital for Nervous Diseases, Queen-square, during the past three years of eight verified cases of primary carcinoma of the lung associated with metastases giving rise to signs or symptoms of central nervous system involvement. The vigorous metastasising power of lung carcinomata has been noted frequently and has been attributed to the vascularity of the organ, to the frequent invasion of the blood-vessels by tumour, and to the abundant lymphatic channels. The frequency with which cerebral abscess follows bronchiectasis or pulmonary abscess is well known to every student, but the close association of pulmonary with cerebral carcinoma has received less attention in this country. The central nervous and osseous systems are much more frequently the site of secondary deposits from primary lung carcinomata than is generally recognised. A study of the post-mortem records of the National Hospital, Queen-square, shows that during the past ten years, out of a total of 29 tumours of which the secondary deposits produced signs or symptoms of central nervous system involvement, nine were of pulmonary origin.

This number was rivalled only by the cases of primary carcinoma of the breast, and in these the secondaries were chiefly in bone. In a recent article Weller[6] says: "The most noticeable omission from our series of cases is that of one illustrative of those who enter neuropsychiatric clinics because of changes dependent upon metastases to the brain or meninges." Dosquet [7] found central nervous system involvement in 37 per cent. of 105 cases of carcinoma of the lung; Fried [8] found 9 cases out of 19 lung carcinomata with cerebro-spinal symptoms. Although common, this association is not generally recognised, and the fact that, with one possible exception, it was not diagnosed in any of the present cases nor in many of the recorded cases is our excuse for emphasising it. The possibility of successful radical surgical treatment of the primary lung lesion and the advances in radium therapy increase the need for closer investigation and observation of these cases. The explanation of the difficulties probably lies in the fact that clinically the cases may present themselves in very diverse fashions.

First, there are the patients who show signs and symptoms of a chest lesion alone and in whom there is no ante-mortem evidence of cerebral metastases.

Secondly, cerebral symptoms may arise in the course of treatment for a pulmonary lesion. These cases are often found in a general or chest hospital; the neurological signs and symptoms are rather vague and indefinite and are probably attributed to toxæmia or cachexia.

Thirdly, there are the cases with which we are dealing where the chest signs are but few and receive scant attention, whereas the neurological signs and symptoms are prominent.

Fourthly, there are the few cases which die in coma without having previously presented any definite signs of pulmonary or nervous disease.

Since the clinical manifestations are so varied the problem obviously abounds with difficulties, especially as some of the most elusive medical problems are those which lie between two special departments—for example, pulmonary and neurological.

In the majority of the cerebral cases the symptoms are due to intracerebral deposits and in only a few to secondary pressure signs from cranial (bone) metastases. On the other hand, in the spinal group only seven or eight cases of true intramedullary secondary deposits have been recorded, and in the majority the symptoms result from pressure—either sudden or gradual in onset—from metastases in the vertebral column. Winkelman and Eckel [9] have noted a sharp clinical demarcation between the cerebral and spinal cases; Case 5 in our series is interesting in showing how cerebral signs and symptoms may arise from the extension of a vertebral lesion upwards to the base of the skull, so that a neurological picture like that of disseminated sclerosis or cerebro-spinal syphilis is presented.

Case Reports.

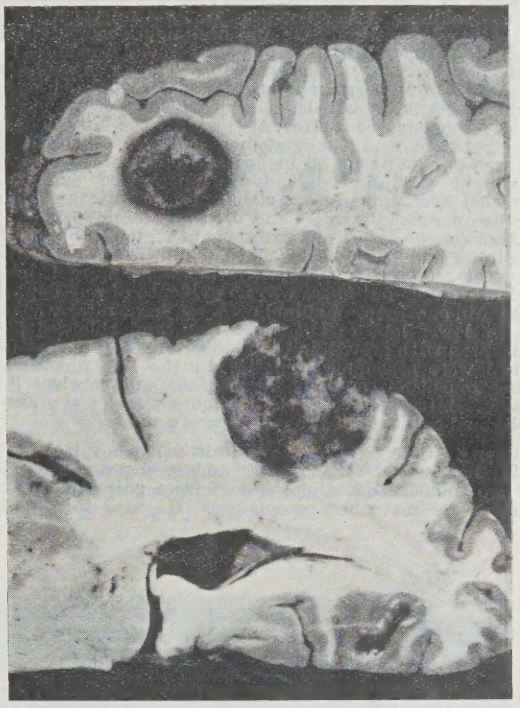
CASE 1, male, aged 37, was admitted in April, 1927, complaining of fits, headache, vomiting, and right-sided weakness of ten weeks' duration. In February, 1927, he noted, while driving a car, that his right leg was jerking. Many attacks of right-sided convulsions followed, usually heralded by twitching in the right buttock. He was well nourished and intelligent with hesitant speech. His right arm and leg were weak, hypotonic, ataxic, and defective in the sense of position and passive movement; the tendon-jerks in the right upper limb were exaggerated and the abdominal reflexes absent. The lungs were normal.

In May, 1927, a left parietal bone-flap was reflected, but no tumour was identified. Papilloedema, aphasia, and a right hemiplegia accompanied by marked emaciation preceded death in August, 1927.

Autopsy.—A large soft hernia, containing a tumour, was seen in the left parietal area and five tumours were found in the frontal, temporal, and occipital regions. The cerebellar hemispheres contained four tumours. All the tumours were rounded and clearly demarcated, frequently by a zone of hæmorrhage, from brain tissue. The superficial growths resembled small strawberries in colour and granularity (Fig. 1). A firm, whitish growth with many enlarged glands was found spreading outwards from the root of the left lung; the left upper lobe showed a purulent broncho-pneumonia.

The spleen contained two large, white, rounded tumours; the other organs were normal. Microscopically, all the tumours presented very similar characteristics, although relative differences were present in the various organs. They consisted of trabeculæ of large columnar cells, with their long axes parallel, and in the centre oval or rounded cells with comparatively little cytoplasm. The amount of fibrous tissue varied considerably; it was very pronounced in the centre of the hilar mass but only slight in amount in the brain, where the picture presented was that of trabeculæ

FIG. 1.



Horizontal sections of cerebral hemispheres (Case 1) showing secondary deposits, well demarcated, surrounded by a zone of hæmorrhage, and, below, of "strawberry type."

of carcinoma cells with a central core of blood-vessels, the latter being immediately surrounded by a narrow zone of connective tissue (see Figs. 2 and 3).

CASE 2, male, aged 57, was first seen in November, 1927, complaining of loss of memory and drowsiness. Ten months previously he had had influenza (headache, drowsiness, and inversion of sleep rhythm); five months later he had pneumonia and pleurisy. The X ray taken at that time showed diffuse opacity at the base of the right lung, suggesting pleural effusion and thickening. He had been discharged from hospital in June, apparently well; shortly afterwards he had become very depressed, with poor memory and concentration. Later he had complained of weakness of the right arm and leg; this had improved but had recurred, together with incontinence of urine and fæces. He was pale but fairly well nourished, with a Parkinsonian facies but no speech defect; his cerebration was slow and his coöperation poor. His visual acuity, fields, and fundi were normal. All conjugate movements of the eyes, other than downward movement, were defective. He showed reversed Argyll Robertson pupils, and his tongue was tremulous and protruded with difficulty. The upper and lower limbs showed a generalised weakness and wasting, more marked on the right side. Apart from absence of the abdominal reflexes and a right extensor plantar response the reflexes were normal. Routine examination of the lungs revealed no abnormality. A presumptive diagnosis of post-encephalitic Parkinsonism was made, but a fortnight after admission he suddenly became comatose and died within 24 hours.

Pathological Examination.—The convolutions of the brain were markedly flattened; seven deposits were present in the pons and cerebellar hemispheres. The right lung

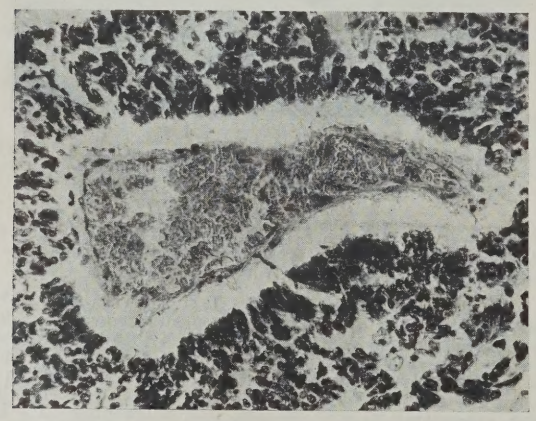
contained a mass of growth, extending from the hilum into the lung tissue; œdema and patchy consolidation were present in the right lung. The left lung was healthy. The tracheobronchial glands were enlarged and infiltrated with tumour. A carcinomatous nodule was seen between the right kidney and suprarenal. Microscopically, the tumours were composed of trabeculæ of cells with a varying amount of connective tissue stroma, in which many large thin-walled blood channels were seen. The cells were ovoid or elongated in type, the outer ones in the trabeculæ being arranged radially with a flattened end in contact with, or shrunken away from, the fibrous tissue. The stroma was much more marked in the lung and suprarenal tumours than in the brain; plasma cells were seen in fair numbers in the fibrous septa and mitotic figures were numerous.

CASE 3, male, aged 34, complained on Feb. 8th, 1928, of unsteadiness of the legs and of pain on the right side of 14 days' duration. He was well nourished, intelligent, and bradykinetic, with a left-sided facial weakness; the right pupil was larger than the left. There was weakness of the left arm and leg; the arm-jerks were sluggish and the right knee-jerk brisker than the left. The gait was unsteady with a tendency to fall forwards and to the left. The liver was enlarged and the abdomen doughy. On Feb. 23rd he was unable to sit up in bed and complained of pain in the right chest and difficulty in speaking; examination revealed nystagmus and a right extensor plantar response. He became rapidly worse and died on March 30th.

Pathological Report.—Two masses of tumour projected from the inner and outer tables of the skull in the right fronto-parietal region; the subjacent meninges were thickened and opalescent but there was no evidence of any deposit in the brain substance or spinal cord. A large mass was found in the lower lobe of the right lung, and enlarged glands infiltrated with growth in the right hilum and mediastinum. There were secondary deposits in the left pleura, liver, lesser omentum, and the abdominal and cervical lymph glands. Microscopically the tumours were of the oat- and polygonal-cell type of bronchial carcinoma.

CASE 4, male, aged 56, was admitted to hospital in May, 1921, because of forgetfulness and strangeness of manner of two months' duration. Apart from pains in the knees there were no other complaints. He was thin and his

FIG. 2.

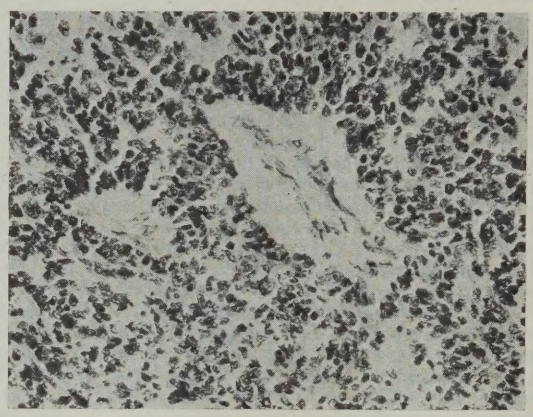


Section of pulmonary tumour (Case 1) showing typical cell arrangement round a blood-vessel.

orientation was poor. The left pupil was larger than the right and there was fine nystagmus on extreme lateral deviation and bilateral tremor of the outstretched arms. The abdominal reflexes were diminished on the left side, and there was a left extensor plantar response and an exaggerated left knee-jerk. Apart from slight cough nothing was found to indicate a lesion of the respiratory system. While in hospital he had two attacks of unconsciousness, followed by general deterioration, further impairment of mentality, drowsiness, irregular pyrexia, double incontinence, and bilateral extensor plantar responses. He died in September, 1921. The cerebro-spinal fluid showed 22 cells per c.mm., 0·08 per cent. of albumin, and excess of globulin, but was otherwise normal.

Pathological Examination.—There was extreme emaciation.; two tumours were present on the surface of the brain, one in the right frontal region and the other in the left cerebellar hemisphere. A large tumour mass was found at the base of the right lung; the overlying pleura was densely adherent and infiltrated with growth. A tough-walled cavity containing greenish fluid pus was present in the tumour mass. There were a few enlarged glands in the right hilum but otherwise no involvement of glands in the mediastinum or left hilum. Broncho-pneumonic changes had occurred at the base of the left lung. Microscopically, the pulmonary neoplasm was composed of small round cells with large deeply staining nuclei; numerous plasma

FIG. 3.



Section of brain tumour from the same case. The cells are more irregularly arranged.

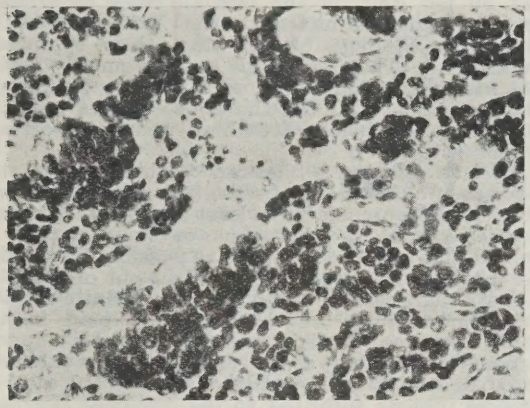
and endotheloid cells were seen. There was no trabecular or alveolar arrangement of the cells as in Cases 1 and 2, and but little fibrous tissue. The cells in the brain tumour were similar in type but slightly larger in size.

CASE 5, male, aged 21, five months before admission to hospital in December, 1927, had sustained a slight injury to his back and had been in bed for three days. A fortnight later he had had a further slight injury and had been in bed for seven days. He had also complained of dyspnœa. Three months later he had had diplopia; one month later he had complained of weakness and numbness of both legs. He was poorly nourished and slightly cyanosed but psychically normal. There was complete paralysis of the right sixth nerve, nystagmus to the left, ataxia in the upper limbs, and complete paralysis of lower limbs. The reflexes were brisk and the tone in the thighs increased, but the calf muscles were toneless. The abdominal reflexes and ankle-jerks were absent but the knee-jerks were normal. The right plantar response was extensor. There was complete loss of all forms of sensation below the eighth dorsal segment on the right and the tenth dorsal segment on the left side. Examination of the chest revealed an impaired percussion note at the left base in addition to generalised rhonchi and bilateral harshness. The fingers were clubbed. Two weeks after admission, signs of consolidation were found at the right apex. Radiography revealed a right apical opacity, thought to be possibly carcinomatous but more probably tuberculous. In December, 1927, there was no demonstrable weakness of the right sixth nerve, although the patient still complained of transient diplopia. The right supraclavicular glands were palpable. Extensive bedsores developed, accompanied by cystitis and diarrhœa; marked emaciation preceded death in February, 1928.

Pathological Report.—The body was very emaciated; the brain, spinal cord, and pia-arachnoid appeared normal. Extradurally, extending throughout the length of the cord and eroding the vertebral bones slightly, were numerous soft masses of growth, most prominent at the mid-dorsal level but continuing upwards into the cervical region and skull, where a fairly large mass lay between the dura mater and a very much thinned occipital bone just to the right of and behind the foramen magnum. Numerous other soft sessile tumours—apparently causing no compression of the brain—lay between the dura and the cranial vault. The appearance suggested by these flattened tumours lying in their eroded depressions in the bone was reminiscent of oysters in their shells. The pituitary gland was cushioned up by a tumour mass lying between the gland and the basi-sphenoid; no other tumours were seen over the base of the brain. Similar sessile tumours were found substernally, prevertebrally, and on the left ninth and tenth ribs. A large solid mass was found near the hilus, continuous with

the prevertebral masses; the upper lobe was completely collapsed, and there were secondary deposits in the liver, right cervical, and abdominal lymph glands. Microscopically the tumours all presented similar appearances; the cells were arranged chiefly in columns and those which abutted on the intervening fibrous tissue were of columnar type. This trabecular arrangement was not universal, the appearance presented in some areas being that of a homogeneous mass of spheroidal or oval-shaped cells. There

FIG. 4.



Section of pulmonary tumour (Case 5). Cells are arranged in trabeculæ and at one point are seen surrounding a blood-vessel.

was a considerable amount of fibrous tissue but few blood-vessels (see Fig. 4).

CASE 6, male, aged 43, was admitted in November, 1927. Eleven weeks previously, during a severe asthmatic attack, he had complained of weakness of both legs; this had been followed three weeks later by lumbo-sacral pain, which had radiated forwards on the right side, and by some paroxysmal cough with scanty expectoration. When three years old he had suffered from pulmonary congestion, and from youth upwards he had been subject to asthma. He was cyanosed and dyspnœic, and showed bilateral weakness and wasting of the lower limbs. The right knee and left ankle-jerks were absent and the left knee and right ankle-jerk were exaggerated. The abdominal reflexes were absent, and the plantar response flexor on the right and extensor on the left. There was well-marked kyphosis. Apart from harsh breath sounds with prolonged expiration, nothing abnormal was detected in the respiratory system, and no tubercle bacilli were found in the sputum. The X ray suggested tuberculous affection of the lungs, but no bony disease was seen. The patient was bedridden whilst in hospital. His dyspnœa increased, his general condition deteriorated, and he died in November, 1927.

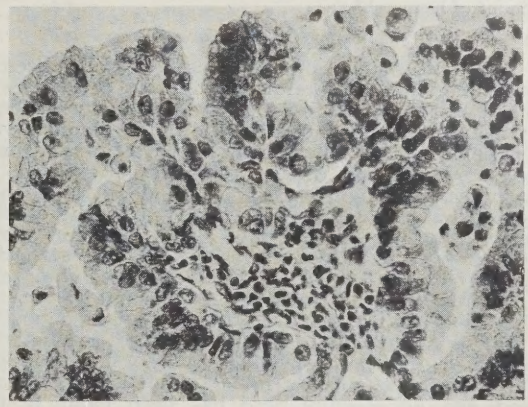
Pathological Report.—The body was emaciated, and the brain normal. On removing the spinal cord a purulent exudate appeared at the level of the tenth dorsal vertebra on the left side and at the level of the second lumbar vertebra on the right side; the bone in these regions was softened and rarefied. The left side of the sacrum was infiltrated with growth and on section exuded a creamy fluid; the dura mater and spinal cord were apparently unaffected. In the right lung a mass of growth was seen spreading from the hilum into the base, and in the middle lobe there was an area of collapse. There were secondary deposits in the liver. Microscopically the pus consisted of large mononuclear and bone-marrow cells; the tumours were composed of fairly solid trabeculæ of cells with elongated dark-staining nuclei. In some situations, especially in the liver, there was a tendency for the outermost cells of the trabeculæ to be arranged in palisade formation, but for the most part they were clustered irregularly together, in some cases around a central vessel. The cells varied in type; the nuclei were elongated and stained deeply, the cytoplasm showing basophil staining.

CASE 7, male, aged 44, was first seen in January, 1929, in a stuporose condition. Seven years previously he had had pleurisy; six months previously he had complained of severe occipital headache followed by giddiness, vomiting, and failing vision. His judgment, perception, and memory were impaired; walking became difficult, and he was unable to read or write. He was emaciated and very drowsy, and showed incontinence of urine and fæces, bilateral papillœdema, weakness of the right seventh nerve and right arm, and coarse tremor of the outstretched arms; the "grasp reflex" was elicited in the right hand. The deep reflexes were exaggerated, and the right abdominal reflexes absent; the right plantar response was extensor. Tests for aphasia revealed errors in recognition of common objects, in reading, and in writing. In January, 1929, a left temporal decompression was performed but no tumour was identified.

Pathological Report.—The body was markedly emaciated. A large tumour was seen on the upper surface of the left cerebellar hemisphere; it was not adherent to the falx and was embedded in the cortex. The left lung was adherent behind the hilum to the vertebral bodies, and its lower lobe was partially consolidated; throughout this lobe small areas of agglomerations of miliary whitish points were scattered. Similar areas were found in the right lung, but the bronchial glands were not enlarged. Microscopically, examination of the left lung revealed a small area of early bronchial carcinoma with considerable interstitial fibrosis; most of the tumour cells had broken away from the basement membrane, had lost their columnar shape, and appeared as large oval or cubical cells, grouped in clusters amongst a mass of fibrous tissue. The whitish areas noted macroscopically showed broncho-pneumonic changes. The cerebral tumour was papillomatous in structure and showed definite acinar formation; the cells were columnar in type, large, with clear cytoplasm, and contained droplets of mucus (see Fig. 5).

CASE 8, male, aged 43, was admitted in June, 1928, complaining of headache, vomiting, and drowsiness of four months' duration. Visual hallucinations were present in the right field, but there was no history of fits. For several months his voice had been husky and he had coughed up a considerable amount of phlegm. He was well-nourished; his coöperation was poor; he was facile, and had a poor memory for recent events. There was bilateral papillœdema, and the visual fields were peripherally constricted. The left pupil was larger than the right, and there was slight right facial weakness. A fine tremor, more marked on the right, was present in the outstretched arms. The respiratory system was normal. Whilst in hospital he had several epileptiform convulsions. On July 17th a left temporo-parietal decompression was performed. Intracranial tension was markedly increased but no tumour was identified. His

FIG. 5.



Section of brain tumour (Case 8) showing papillomatous arrangement of cells.

condition became progressively worse and he died 14 days later.

Pathological Report.—The body was well nourished. A small, lobulated, firm, white tumour with much surrounding œdema was found in the right frontal lobe. Several enlarged glands were present under the manubrium sterni and at the tracheal bifurcation. In the upper lobe of the right lung a large clearly demarcated mass of growth was seen and there was a small tuberculous focus at the right apex. Microscopically the lung tumour was composed of ill-defined trabeculæ of columnar cells lying between dense strands of fibrous tissue; the cells were very few in number in the lung but more numerous and more definitely columnar in the glands. In the brain the tumour was very sharply demarcated, and around it there was a remarkable overgrowth of neuroglia with the formation of large-bodied spider cells. The trabecular arrangement of the cells was well seen in the brain (cf. Case 2), where a central blood-vessel was seen to

be immediately surrounded by a zone of connective tissue and small round cells, whilst more distally columns of large columnar cells, with vesicular nuclei, were arranged with their axes at right-angles to the vessel wall. There was considerable small round-celled infiltration in the fibrous tissue septa, which were not so well marked as in the primary pulmonary lesion.

CASE 9, male, aged 49, was admitted to hospital in April, 1929, with a ten days' history of left-sided Jacksonian attacks, followed by weakness of the left arm and leg. He had had a harsh cough for a week before admission but no previous history of chest trouble. He was dysarthric; his mentality was good and his pupils eccentric, reacting well to accommodation but sluggishly to light. Convergence and upward movement were impaired in both eyes; there was diplopia on looking downwards and to the right, and coarse, irregular nystagmus to this side. There was complete paralysis of the left lower face and weakness of the left trapezius and sternomastoid muscles, together with flaccid paralysis of the left arm and leg, an exaggerated left knee-jerk, absent left abdominal reflexes, and an equivocal left plantar response. The senses of passive movement, position and stereognosis were lost in the left hand. The respiratory system was normal. Two days after admission he was dyspnœic, had intense pain in the left shoulder, and became much more drowsy. The percussion note was dull over the left lower lobe. Vocal resonance was impaired and the breath sounds were distant, but no adventitious sounds were heard. A week later these abnormal signs had disappeared, but the neurological condition remained unchanged. A few days later coma supervened, and he died on May 5th, 1929.

Pathological Report.—The body was emaciated. A white mass was found at the root of the upper lobe of the right lung. This lobe was œdematous and bronchiectatic; broncho-pneumonia was present at the base of the left lung. In the upper post-central region of the right cerebral hemisphere there was a rounded, soft, slightly hæmorrhagic area of tumour surrounded by œdematous brain tissue. Microscopically the lung tumour was well demarcated; its cells, columnar in type, were arranged in trabeculæ separated by strands of fibrous tissue. The typical arrangement of cells grouped around a central vessel was seen, but for the most part they were arranged irregularly in cluster formation; a considerable amount of hæmorrhage was present. In the brain tumour the typical arrangement around a blood-vessel was well seen. The cells were larger than those in the pulmonary tumour; the nuclei were oval and vesicular. Fibrous tissue was scanty, but there was a considerable amount of hæmorrhage.

Clinical Discussion.

In part, the object of this investigation has been to determine whether careful examination of a series of secondary brain tumours from a primary lesion—for example, a carcinoma of the lung—would reveal a typical clinical picture or metastatic syndrome, the knowledge of which would have enabled an ante-mortem diagnosis to be made. As already pointed out, the relative part played in the clinical picture by the lung and brain lesions varies considerably in different cases. Hence attention has to be paid, on the one hand, to the signs and symptoms of the pulmonary neoplasm and, on the other hand, to the results of the secondary deposits; it will be remembered that we are here dealing with the third group mentioned in the introduction. The above case reports have been carefully scrutinised and an especial note has been made of the following points.

Sex.—All the patients in this series were males. The predominance of the occurrence of pulmonary carcinoma in the male sex is such a striking feature that it attracts the attention of all investigators.

Occupation.—Many authors have assumed that the increased incidence of pulmonary carcinoma in recent years and its prevalence in the male sex must in some way be connected with occupation. The Schneeberg miners in Saxony, where various metallic substances are present in the dust in the mines, are especially liable (Arnstein).[10] Hudson[11] noted a high incidence in grooms and suggested the frequent exposure to the inhalation of dust as the causative factor. Duguid[5] found that labourers formed the largest percentage (28 per cent.) of affected workmen following one occupation; the suggestion is also made that the increase is due to tar, which is used so much more now than formerly for road-spraying (Staehelin[12]). The occupations of our patients were—insurance agent, dairy manager, printer, labourer, clerk, motor-driver, tram conductor, and secretary. None of these occupations would appear to be of any ætiological importance.

Age.—The youngest patient in this series was 21 and the oldest 57; the average age was 42 (six of the nine patients were over 40). In Simpson's[8] series of 139 cases the average age was 48. This is rather above the average age incidence of cerebral tumours in general; in Tooth's series[13] the average age of all tumours was 35–40. We note, however, that 50 per cent. of the last 20 cases of primary frontal tumour admitted to the National Hospital were over the age of 40 when their symptoms commenced. Thus, although it is frequently stated that metastatic deposits from a primary pulmonary lesion occur late in life, the above figures must be borne in mind before attaching undue importance to this factor.

Previous History.—Shennan[14] thinks that the presence of old-standing disease (tuberculosis, chronic interstitial pneumonia) in at least 13 out of 22 primary carcinomata of the bronchus or lung cannot be ignored and must be regarded as possibly influencing the onset of the neoplasm. In eight out of our nine patients there was a history of some definite respiratory abnormality—bronchial asthma, pain in the chest, dyspnœa, persistent cough—or a lesion was suspected in the chest as the result of routine examination. In comparison, 7 only of the last 40 cases of cerebral tumour admitted to the National Hospital, Queen-square, gave a history of any respiratory abnormality and in none of them was a chest lesion suspected. Yet, despite the positive history, a presumptive diagnosis of a primary lung tumour with secondary cerebral metastases was made in only one case. Closer attention should be paid in doubtful cases to a history of respiratory abnormalities, and a more thorough clinical and radiographic examination of the thorax should be made.

Duration of Symptoms before Admission.—This varied from ten days to six months with an average period of about three months. The average duration of symptoms of cerebral tumours in general before coming under observation is longer than this. In the present series, the average total duration of illness was six months and the shortest period two months.

Mode of Onset.—Neurological symptoms were the first manifestation of disease in five cases, whereas chest and neurological symptoms appeared almost simultaneously in four. Of the seven patients in whom cerebral symptoms were the first or simultaneous manifestations of disease, in three the first complaint was of a psychological change; in two, Jacksonian attacks occurred and in two the symptoms were those of increased intracranial tension (headache, vomiting). In six of the cases the onset of the symptoms was fairly sudden and something of the nature of an ictus was observed, possibly due to neoplastic embolism.

Later Signs and Symptoms.—Correlation of the ante-mortem signs and symptoms with the post-mortem findings did not reveal anything striking, but only served to emphasise the many general difficulties encountered in the localisation of cerebral tumours and in the separation of true and false localising signs. Some workers have noted an especial difficulty in interpreting the signs in metastatic cerebral carcinomata and have attributed this to the presence of multiple tumours; of the seven cases with intracranial metastases the tumour was single in four.

Site of the Tumour.—Grant[15] and Krasting and Silvan refer to the special frequency of metastases on the left side of the brain and attribute this peculiar selection to the cerebral vascular arrangement. In our series, in three cases the tumours were bilateral, in three cases the neoplasm lay on the right side, and in only one was there a single tumour in the left hemisphere.

General Condition of the Patient.—There was extreme emaciation in four cases; in three the body nutrition

was fair, and in two it was quite good when the patient came under observation, but there was a very rapid loss of weight before death.

Pyrexia.—Five of the patients showed irregular pyrexia; two cases were apyrexial and in two the temperature was raised only in the post-operative period. Moise [16] found pyrexia in all his cases.

Papilloedema.—Of the seven cases in which intracranial neoplasms were found, three showed papilloedema and in four the discs were normal. Globus and Selinsky [17] state that papilloedema in these cases is infrequent.

Psychological Condition.—Three of the seven cerebral cases were almost normal, but in four the cerebration, coöperation, and memory were poor and depression or euphoria was present. In three cases the psychological symptoms were pronounced early in the disease and in each a frontal tumour was present. On the other hand, one of the patients, who was normal psychologically until about ten days before death, had tumours in both frontal lobes. The importance of a history of sudden onset of a psychosis in making a diagnosis of a metastatic cerebral carcinoma is emphasised, among others, by Grant, McCarthy, Crouzon, Hyde, and Curschman. The alternating periods of delusions and clarity, to which Siefert [19] called attention, were not observed in our cases. The general tendency was to an increasing drowsiness and lethargy, and to a gradual increase in mental confusion and a desire to be left alone, without any marked restlessness or noisy, busy delirium. In only one patient (No. 8), who was markedly euphoric and in whom a frontal tumour was found, was there any tendency to restlessness.

Speech.—Siefert [19] stated that a "peculiar disturbance of speech" was to be noted in these cases. Of our seven cases, some abnormality was observed in five. The nature of the defect seems to have been rather obscure; the descriptions in the clinical notes included slight defect, dysphonic, indistinct, husky, dysarthric. Possibly in some of the cases the abnormality was the result of intrathoracic pressure.

Recognition of a Syndrome.

Many points have been discussed in order to attempt to account for the inaccuracy of the ante-mortem diagnoses, to permit of criticism of the findings of previous investigators, and to determine whether a "cerebral-metastatic syndrome" could be established. The conclusions arrived at by various authors vary considerably. For example, Winkelman [9] and Shelden [18] state that there is no characteristic group of symptoms by which a metastatic tumour of the nervous system can be recognised. Other investigators are intermediate in their views and think that there are no definite peculiar physical signs but that there are some peculiar features, such as abnormal wasting and the sudden development of a psychosis. Globus and Selinsky [17] were tempted to regard the following as characteristic of metastatic brain tumours: (*a*) the acute and precipitate onset of cerebral manifestations, often of a disjointed and disseminated character; (*b*) symptoms of intracranial pressure out of proportion to the neurological findings; (*c*) infrequency of papilloedema; (*d*) meningeal signs and radicular pain; (*e*) rapid decline with diffuse signs; (*f*) psychotic manifestations. Seifert [19] gives the following picture which he believes leads to the probable diagnosis of multiple carcinomatous metastases in the central nervous system: (*a*) occurrence in advanced age; (*b*) rapid failure of health; (*c*) increasing apathy; (*d*) alternating periods of delusion and clarity; (*e*) peculiar speech disturbances; (*f*) infrequent papilloedema; (*g*) pain in the neck; (*h*) vesical disturbances; (*i*) weakness of the extremities and the right seventh nerve; (*j*) changes in the gait and tendon reflexes.

Our observations lead us to think that it is incorrect to say that there are no special features by which these cases may be recognised; on the other hand, there is not a clear-cut cerebral metastatic syndrome characteristic of all cases whether the primary lesion is in the lung or elsewhere. Nevertheless, there are certain features which are common to the majority of cases and a typical case might be portrayed as follows: An elderly patient, with wasting—out of proportion to the extent and duration of the cerebral symptoms—early confinement to bed, pyrexia, a short history with possibly a sudden onset of a psychosis followed by a temporary recovery, radicular pain, vague chest signs or a history of a respiratory abnormality, and a rapid progression to death.

Points such as the infrequency of papilloedema, speech disturbances, vesical disturbances or multiplicity of cerebral signs do not appear to be of sufficiently distinctive value to merit inclusion. Although the features which are most frequently encountered in these cases have been combined in order to present a composite typical picture, it must be remembered that some cases, possessing only three or four of these points, may present a markedly different appearance. For example, Case 1 was a man of 37, who was apyrexial, normal psychologically, and who showed no abnormal chest signs. In any obscure cerebral lesion, it is important to bear in mind the possibility of a metastatic cerebral tumour and the necessity for a careful and complete clinical and radiological examination.

Pathology.

The views on the pathology of primary carcinoma of the lung have recently undergone considerable change. At one time it was usual to classify these tumours into: (*a*) columnar-celled type arising from the bronchial mucous membrane; (*b*) polyhedral-celled type arising from the bronchial mucous glands; and (*c*) squamous-celled type from the alveolar epithelium. Shaw Dunn [22] has pointed out the extreme difficulty in classifying pulmonary neoplasms according to this scheme, in view of the pleomorphic nature of the cells composing the neoplasm. Duguid [5] says: "Although there is a wide variation in the structure, even the most remotely divergent cases appear to be linked together by a series of intermediate types, which makes it difficult to see where any division in classification could be made." Shennan [14] stresses the marked degree of pleomorphism of the cells seen in a great proportion of these tumours, but considers that he is able to recognise six types. In addition Barnard,[20] in 1926, showed that many of the so-called mediastinal sarcomata were in reality carcinomata of pulmonary origin; they were designated by him "oat-celled" carcinomata. He considered that there were two groups of pulmonary carcinomata: this oat-celled variety and an obviously carcinomatous type in which the cell picture varied from the columnar, mucus-secreting type at one end of the scale to a squamous-celled type at the other, with intervening forms showing polygonal, spheroidal, or cubical cells. These facts are recalled because in all but one case of our series the primary tumour was situated in or near the hilum of the lung and at one time would probably have been regarded as a mediastinal sarcoma.

The tumours were firm and white in colour, and in seven of the cases were found on the right side. Evidence of bronchial obstruction—pulmonary collapse or bronchiectasis—was present in six cases. Microscopical examination emphasised the pleomorphic nature of the cells composing these tumours. The cells, roughly columnar in type, were arranged in solid trabeculæ and showed a tendency to the formation of acini. Between the trabeculæ were situated strands of fibrous tissue which carried the blood-vessels. A cross-section of such an arrangement represented what might be regarded as a unit, the whole picture being composed of a collection of these units. Each unit consisted of a central blood-vessel surrounded by connective tissue which was separated from an outer layer of connective tissue by a clear area; in this space, in many cases, collections of small round cells were found. Abutting on this outer layer of connective tissue was a single row of columnar cells

and beyond this again was a mosaic of cells of cuboidal or spheroidal type. The cells varied markedly in shape and size, some being oval, some columnar, and others cubical; in addition, groups of cells were irregularly clustered between the units. The cell nuclei were large and vesicular and numerous mitotic figures were seen in many of the sections (see Figs. 2 and 3).

Several of the features of the metastases have been pointed out in the descriptions of the cases, but we would call attention again to the production in three cases of cerebral or spinal symptoms from secondary deposits confined to bone and not apparently invading the nervous tissue. Globus and Selinsky have remarked on this selective action of these secondary deposits in certain cases. The "hollowed-out and oyster-shell" appearance on the inner aspect of the skull and vertebræ formed a conspicuous feature; in one case the tumour was adherent to the dura, but there was no macroscopical evidence of involvement of the pia-arachnoid. Cornwall [21] has recently described a case where metastatic involvement of these membranes was apparent on microscopic examination, although there was no evidence macroscopically of tumour formation. Invasion of the meninges, apparent only on microscopical examination, is also referred to by Morse.[23] Winkelman and Eckel [9] subdivided these cases according to whether the dura or pia mater was involved; the former they termed pachymeningitis carcinomatosa and the latter meningitis carcinomatosa. This meningeal invasion probably accounts for the presence of constant and severe radicular pain in some of the cases. We have already noted the strawberry-like appearance of the intracerebral tumours, their surrounding zone of hæmorrhage, and their strict macroscopic demarcation from the surrounding brain tissue. Microscopically an overgrowth of neuroglia with spider-cell formation could be demonstrated at the margin of the tumour. The microscopical appearances of the secondary deposits were similar to those of the primary pulmonary tumour. On the whole, however, the cells were larger in size and varied in shape from true columnar to oval; in many cases an alveolar arrangement could be made out. The nuclei were deeply stained and rather small. Fibrous tissue varied in amount but was, generally speaking, more scantily distributed than in the lung tumours.

Conclusions and Summary.

1. Nine cases of primary lung tumour with metastases giving rise to cerebro-spinal symptoms are reported, with clinical and pathological details.

2. The suggested factors in the ætiology of primary lung carcinoma are discussed; no further information is forthcoming as to the cause or the recent increase in incidence.

3. The views of previous investigators as to the existence of a cerebral metastatic syndrome, or peculiar features by which a metastatic cerebral tumour could be recognised, are criticised.

4. A composite typical picture of a metastatic cerebral carcinoma is presented.

5. The macroscopical and microscopical appearances of the lung and cerebral lesions are detailed.

6. The necessity for bearing in mind the possibility that a cerebral lesion may be a metastatic carcinoma from the lung or some other source is emphasised.

7. The difficulties in diagnosis necessitate a complete and careful examination, clinical and radiological.

We wish to express our gratitude to the physicians of the National Hospital, Queen-square, for permission to publish reports of the cases under their care, and to Dr. J. Godwin Greenfield for his ready help and kind assistance, especially in the preparation of the microphotographs.

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"RUSH" INOCULATION,

WITH SPECIAL REFERENCE TO HAY-FEVER TREATMENT.

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THE approach of the hay-fever season recalls to the mind of the immunologist the whole question of desensitisation—for it is with hay-fever that we have the greatest and longest experience of a specific sensitisation disease. Recent developments in desensitisation of hay-fever patients are most easy to explain when looked at historically.

Passive Immunisation with Serum.—In 1903 W. P. Dunbar, in Hamburg, made the first attempt to desensitise hay-fever subjects to grass pollen by passive immunisation, utilising for this purpose the sera of horses and geese.[1] That method has gradually fallen into disuse.

Leisurely Desensitisation.—In 1909 Noon and I began inoculating hay-fever subjects with a grass pollen vaccine.[2] We began in the off season—i.e., when there was no pollen about—say at the beginning of March; inoculations were given weekly merely because our out-patients at St. Mary's Hospital were in the habit of coming every week. After we had arrived at what we believed to be an effective dose we made little or no attempt to increase it—being influenced in this by the routine practice for therapeutic immunisation. This plan has worked fairly well, and is still perhaps the method in most general use. In view of subsequent quicker methods I have called this older method "leisurely."

Intensive Desensitisation.—Later (1924) when desensitising horse asthmatics or other animal sensitives to horse dandruff, &c., I fell into the way of inoculating these patients every day with gradually increasing doses (a 10 per cent. to a 20 per cent. increase). There was no off season with these people, and they were usually in a great hurry to go and hunt, or look after their dogs, or retrieve their cats from quarantine with the veterinary surgeon. This intensive method proved so successful, and was in some ways so convenient, that in 1926 I gave it to a number of hay-fever patients, and have used it increasingly ever since.[3]

"Rush" Desensitisation.—The anti-anaphylaxis method of Besredka suggested a quicker desensi-

[1] Dunbar, W. P.: Zur Ursache und Specifischen Heilung des Heufiebers, München, 1903.

[2] Noon, L.: THE LANCET, 1911, i., 1572; Freeman, J.: Ibid., 1911, ii., 814.

[3] Freeman, J.: THE LANCET, 1927, i., 940.

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tisation, which I have used since 1928. The injections are given every hour and a half to two hours throughout a 14-hour day. Thus a very satisfactory course can be put through in from two to four days. The patient must go into hospital or some such institution, or at any rate be in the charge of a trained nurse, and under the constant supervision of the doctor. As with the previous methods a safe initial dose is estimated by the intensity of the diagnostic reaction (see below); a very slightly sensitive person might receive, say, 100 or even 200 units of pollen; a very sensitive person—i.e., one giving a centimetre-broad wheal when pricked through a drop of pollen extract of 500 unit strength—had better receive no more than 20 or 30 units for the first dose. As with the intensive course an increase of 10 per cent. to 20 per cent. on the preceding dose is made at each re-inoculation if this can be borne by the patient without any discomfort. If there is a reaction, then the percentage increase is slowed down, or stopped, or a smaller dose is given. Because the doses are mounting in geometrical progression it only takes a few days for a dose of, say, 100 units to mount to perhaps 20,000.

The notes of a few typical cases will show the general nature of the "rush" method of desensitisation and its special application to hay-fever. My first case so desensitised was a dust asthma case (presumably mould spores), the second was a fish-sensitive, the third was a horse-asthmatic, and the fourth a hay-fever case from the batch so treated in 1929.

A Dust Asthma Case.

A. B.—In 1928 a man came into our male laboratory ward for intractable asthma. He had neither food sensitisation nor animal asthma. He was much worse in winter when he had "colds," and generally, by a process of exclusion, the case seemed to resolve itself into one of a bacterial sensitisation. At any rate the bronchial infection was an "asthmatic factor" in him; so far as we could see at first it was the most important factor; and it was one we could treat. Suitable inoculations of a bacterial vaccine—aided, as subsequent events suggest, by mere absence from his home—"cured" him and he was discharged from hospital.

He came back three days later, just as bad as ever, with the story that he had relapsed on the very first evening at home. Similar treatment (but in a shorter time) again "cured" him, and he was again discharged from hospital; but he came back next day with the same story of a relapse. A few days later he left the hospital for the third time, quite well, but saying "Keep my bed warm for me, I shall probably be back to-night"; he came back in an hour or so—and just as bad as ever. Clearly we had here a locality factor in his asthma. After he had got well for the fourth time in hospital he was found to react violently to an extract of the fine dust from his house; by intradermal injections he was 3000 more sensitive than the normal man. As he had spent time enough in hospital I embarked on the "rush" method.

He got subcutaneous injections at first every 20 minutes; later on he got them every hour (except during the night), beginning with a very weak dose (80 units) and increasing roughly by 20 per cent. at each re-inoculation. At the end of three days I got him up to a dose of 2 cubic centimetres of the strongest extract I had made—i.e., a dose of 200,000 units. He was then discharged from hospital for the fifth time, and again quite well. He got no asthma at home that night or on subsequent nights; he has had no serious attacks since then.

This quick success seemed—both to the patient and inoculator—more cogent than that of the older and more protracted treatments; and as it was clearly of general application it has since been used[4] with success for desensitisation to animal asthmas (horse and cat), for food sensitisations (fish and egg), and particularly for hay-fever cases. I have tried it for a number of bacterial sensitisations, but have not been so successful with them. Here there is a technical difficulty because attempts at desensitisation influence the growth of the bacteria which are producing the toxæmia; but even here it is believed that "rush" desensitisation has a future.[5]

FIG. 1.

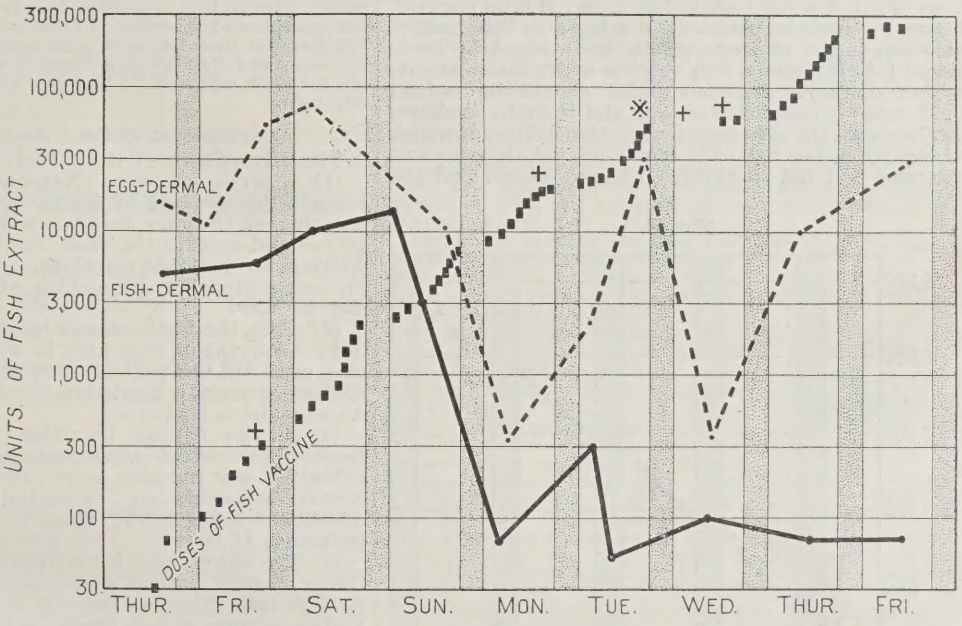


Chart showing the rapidly increasing doses of fish vaccine given to a sensitive patient over a period of eight days, and the effect on his skin reaction to fish and to egg. + = urticaria. ✻ = marked urticaria and headache.

A Fish-Sensitive Patient.

C. D., a boy of 7 years with bad bronchial asthma, had also a number of food sensitisations which were not only helping to keep up his asthmatic condition but were also making him an undernourished and undersized little boy because of the difficulty in feeding him. He was particularly sensitive to fish; his lips blistered on contact with this food which, if swallowed, caused vomiting and diarrhœa, general urticaria, headaches, and increase of his asthma—the usual crop of symptoms in fact. He was

[4] Hart, P. D'Arcy: Proc. Roy. Soc. Med. Section for Study of Diseases in Children. Jan., 1930, p. 265.

[5] In the case described above it was probable that A. B. was sensitive to the mould spores of the locality; it was their presence in the dust which caused him to react to it, and which made an extract of the dust such an efficient antigen. Indeed, he proved slightly sensitive to a large number of stock extracts of mould cultures which I tried on his skin. (He was hardly sensitive at all to Storm van Leeuwen's A. fumigatus strain.) But the fact is that the mycology of such cases is too difficult for our present knowledge; for example, the inoculation department put at my disposal for two years the services of Mr. la Touche, a skilled mycologist, and the chief thing we learnt was the complexity of the business. In one case only of locality asthma we isolated, and as far as possible identified, many hundreds of different strains from various damp and mildewed houses without feeling convinced that we had got near the botanical solution of the case.

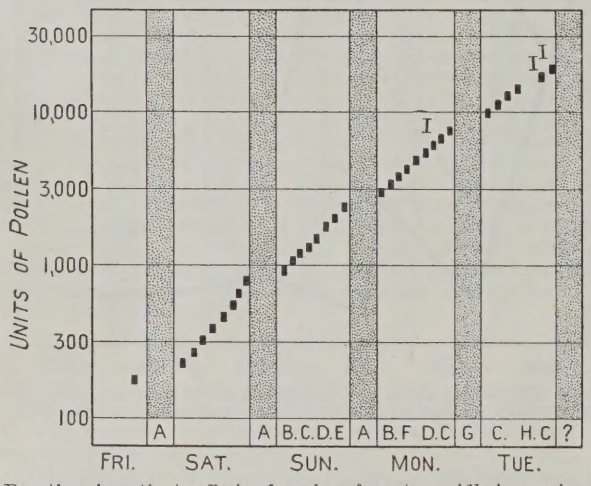
put through a "rush" inoculation using as antigen the juices expressed from cod fish—1 c.cm. of the undiluted juice being taken as a million units.

Fig. 1 shows the mounting doses, which rose from 30 units to 200,000 units in eight days. The chart also shows the effect of these doses on the skin reaction to fish and egg to which he was also sensitive; these were made and measured in Sir Thomas Lewis's way (as described later in this paper), and marks have been assigned to them according to the diameter of the wheal and of the erythema.

After the treatment he was put on to a fish diet, and given an ounce of cod-liver oil t.d.s., which he liked. Ever since then he can eat fish, and has daily doses of cod-liver oil and malt. He is much less faddy about his food, he is putting on weight, and has practically no asthma.

It should be confessed that the skin reaction to fish in this case which disappeared so beautifully under "rush" treatment returned a few weeks later, and now (five months later) is back at its old intensity. This is the general experience in such cases, but does not mean that all the dietetic advantage of the desensitisation has gone; it does suggest, however, that the patient will relapse in this respect also unless the improvement is maintained by occasional injections of a fish vaccine or by insistence on a fish dietary. Another point should be noted: C. D. was also sensitive to egg, and though, as shown on the chart, the skin reactions to this did not diminish so rapidly as the fish skin reactions, yet they became irregular and did diminish to some extent, and the boy was found to be able to eat eggs, a feat which he could not perform before the treatment. This is apparently a non-specific immunisation comparable presumably to the effect produced by protein shock.

FIG. 2.



Reactions in patient suffering from hay-fever to rapidly increasing doses of pollen. Stippled areas in this Fig., as in Fig. 1, indicate nights. A = A good night. B = Reaction at site of inoculation. C = Rash on arms and body. D = Sneezing. E = Throat and nasal congestion. F = Headaches and drowsiness. G = Restless night. H = Rash on body, puffy eyelids. I = Adrenalin 0·08 c.cm. given. ? = Patient out of hospital.

Horse-Asthma.

E. F., a girl of 7, was a horse-asthmatic but wanted to ride her pony, so elected to go into a nursing home to be "made a pin-cushion of." Starting with a dose of 60 units of horse dandruff vaccine she got to a dose of 2450 in four days. After this dose she had a sharp bout of urticaria, her lips swelled, and she felt "funny." The doses were stopped, and three hour later she suddenly went very pale with a fluttering heart. She had, it appeared, several times in the past had similar faint attacks, and this one, like the others, quickly passed away; but it was judged wiser to send her into the country to try the effect of her pony on her. She has ridden daily without discomfort, and she is having a dose of 2000 units every ten days or a fortnight to keep up the good effect, and this 2000 dose may perhaps be cautiously increased.

This case will serve to show the care necessary in conducting what is after all a very strenuous method of treatment. Such treatment for the uncomplicated cases of horse-asthma seems to be consistently successful but they tend to relapse after a period of from three months to a year. However, if a maintaining dose is given every ten days or so, the condition can be kept up indefinitely. I have in this way kept going a number of such cases for three or more years; and they hunt regularly.

Hay-fever.

G. H. is a young gymnastic instructress with uncomplicated hay-fever. She had been inoculated by me in past years with pollen vaccine somewhat perfunctorily but more or less successfully. In the spring of 1929, owing to pressure of work, she had practically no preventive treatment. Early in June she arrived in a desperate state, a mental and physical wreck, and quite unable to carry on her work. She had been getting steadily worse for the last two weeks, but had tried to stick it out. She was taken into hospital and put through a "rush" course of pollen inoculations (see Fig. 2). In four days the dose had risen from 160 units to 17,000 units. The patient then left hospital to catch up the arrears of work—after which she went and "rolled in a hayfield without being able to get a sneeze out of it." She was cured—for that year at any rate.

Advantages of the "Rush" Method.

The advantages of the "rush" method are:—

(1) A saving of time. Not only does the patient become desensitised in a shorter space but there is a saving of tiresome details, such as remembering to go for and getting the dose, and perhaps afterwards waiting for possible reactions. All this amounts to an unconscionable dislocation of affairs if repeated day by day.

(2) Since the business can be put through in a few days a convenient time may be waited for; one may even wait till the patient is in real distress from the disease—always a good time for getting a patient to do what he is told.

(3) As the patient is under observation all the time, a competent nurse can judge the onset and extent of any reaction more exactly, and can adopt counter-measures—e.g., repeated minute doses of adrenalin—more easily than is possible when the patient is at large.

(4) The doses can be adapted to the particular needs of each patient more exactly. Patients vary in their capacities—so may these particular antigens. Pollen vaccine is not precisely the same from year to year; it is difficult to standardise a vaccine of cat scurf. To put this another way, with "rush" desensitisation the exact initial dose does not matter so very much. At the worst one only wastes a day before getting effects.

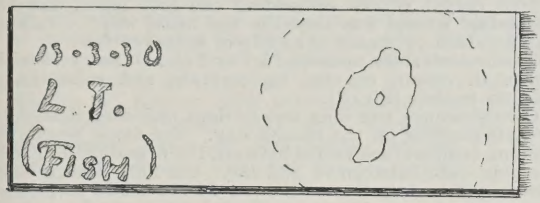
In choosing a system of desensitisation one need not, of course, adhere rigidly to the leisurely, intensive, or "rush" methods; an intelligent blend may serve one's turn better. Thus in the early spring doses may be put in when occasion offers; if by mid-May there have been too few the pace may be quickened up even to once a day; and if unhappily grass meadows demonstrate in June that this has been insufficient, then a short "rush" treatment in a nursing home should clinch the matter.

Whatever system or combination of systems of inoculation is employed, it is necessary to make sure that the sensitisation is to one single foreign substance; or if it is multiple, that the other sensitisation will not interfere with success of treatment—e.g., it is courting failure to desensitise a hay-fever subject with grass pollen only, if the patient is sensitive to, say, a bacterial infection or to mould spores in his house.

Again it is just as necessary to make certain of the specific diagnosis before beginning treatment. For this purpose any of the established methods may be employed: (1) for eye reactions, carefully graded dilutions of the extract may be dropped into the conjunctival sacs. (2) for dermal reactions these same extracts are rubbed into scratches on the skin. (3) for the intradermal reactions a measured quantity

of a known extract is injected into the thickness of the skin. (1) and (3) are the most delicate, but, on the other hand, greater care has to be taken not to test too severely. A convenient method is that

FIG. 3.



Record of a typical wheal and the margin of an erythema by a tracing on a microscope slide.

described by Sir Thomas Lewis[6] in using histamine on the skin; you place a drop of the extract on the forearm or thigh of the patient and then prick through it lightly (not more than a millimetre) into the thickness of the skin with any sharp needle; after this the drop can be wiped off the skin. A control drop of water or normal saline should be pricked through on a neighbouring site—and if the same needle is used the control prick had better be done first. In a positive reaction the resulting wheal or erythema will be observable in 7 minutes or at its best in 10 or 12. The reaction can be recorded by placing a microscope slide over the area and inking in the prick, the margin of the wheal, and the margin of the erythema (see Fig. 3).

By this method a moderately sensitive hay-fever subject will give a just recognisable reaction if a 500 unit per cubic centimetre extract is employed, and a considerably larger reaction with, say, the 5000 unit extract. If a supposed hay-fever subject does not give an easily recognisable reaction with the 5000 unit extract it is doubtful if the symptoms complained of can be due to hay-fever, and desensitisation will not help him.

Conclusion.

The "rush" method of desensitisation offers many advantages when used either alone or in combination with other systems. To get successful and safe results, however, it is just as necessary as ever to be cautious.

[6] Lewis and Grant: Heart, xi., 209.

Clinical and Laboratory Notes.

TWO UNUSUAL CASES OF CALCULI IN THE URINARY TRACT TREATED BY OPERATION.

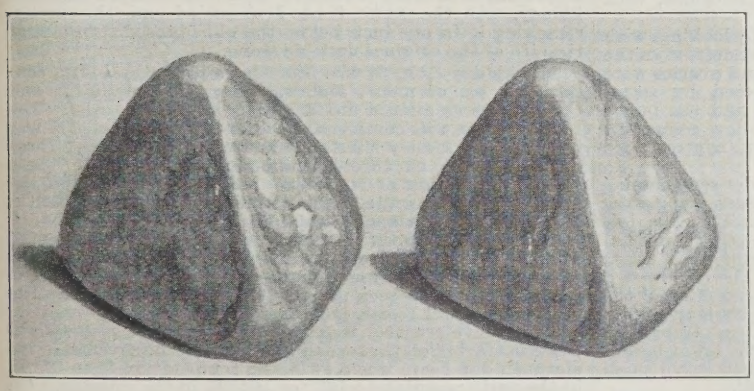
BY LOUISA MARTINDALE, M.D., B.S. LOND.,
SENIOR HON. SURGEON, NEW SUSSEX HOSPITAL, BRIGHTON.

THE two cases here described are both unusual and interesting.

Vesical Calculi Treated by Suprapubic Lithotomy.

The first patient, an unmarried woman of 57 years, sent to me by Dr. Helen Scatliff and Dr. Rodie Parkhurst, was admitted into the New Sussex Hospital on Jan. 4th, 1928. For three years she had had difficulty and pain on micturition, only passing very small quantities at a time; there was no history of hæmaturia. For the last six weeks the pain had been considerably worse, especially at night, so that insomnia and "feverish attacks" had been marked features in the case. The frequency had also increased during the last few weeks until, on admission, the patient was passing urine as often as every ten minutes. She was thin and pale and looked ill. Her appetite was very poor. She showed an evening temperature of 99° F. Nothing abnormal was found in the heart, lungs, or abdomen, but a hard, tender mass was felt anteriorly per vaginam. The urine was very offensive, thick, and alkaline, with much pus and mucus, a specific gravity of 1020, and a slight trace of albumin. Blood was present but no sugar.

FIG. 1 (Case 1).

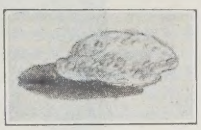


Two symmetrical pyramidal vesical calculi (natural size).

Except for varicose ulcers of both legs since the age of 16 the patient had had no illnesses. The menopause had occurred ten years earlier. The family history was apparently healthy.

On Jan. 5th, 1928, the patient was cystoscoped. The bladder would only retain four ounces of weak boric solution. The end of the catheter was felt to impinge upon a hard object inside the urethral orifice. On introducing the cystoscope it was impossible to get a view of the bladder mucous membrane, but a large foreign body could be felt, and the sharp shadow seen somewhat resembled two edges of wire. Suprapubic lithotomy was therefore performed under general anæsthesia on Jan. 7th. Twelve ounces of boric lotion were introduced into the bladder. The patient was then placed in the Trendelenburg position, a median suprapubic incision about two inches long was made through the abdominal wall, and the bladder was exposed below the peritoneal reflection. A sound was introduced into the bladder through the urethra and with great difficulty identified by the finger through the abdominal incision. The bladder was then opened. A large hard object was felt inside the bladder, seized with forceps, and brought out. This proved to be a large, symmetrical, pyramidal calculus. Another calculus of exactly similar shape, size, consistency, and appearance was found in the bladder and similarly delivered. No further stones were found. A large drainage-tube was inserted into the bladder, and the bladder and abdominal walls were closed in the usual way.

FIG. 2 (Case 2).



Ureteral calculus (natural size).

Recovery was slow. For the first four days after operation the pulse-rate was about 120; the pyrexia was moderate and lasted 11 days. On the second day a self-retaining catheter was inserted through the urethra; bladder washouts were given daily. The hæmaturia and pyuria gradually cleared up, the wound healed, and the patient was able to leave hospital by March 27th. She returned to my follow-up clinic six months and one year after in excellent health.

Examination of calculi.—The two calculi (Fig. 1) are of similar shape, size, and consistency. Each is pyramidal, having four surfaces, each of which is 4 cm. long, whitish-grey in colour, and on section showing concentric laminated surfaces. X ray examination showed no differentiation of structure, and no central foreign body (Dr. E. M. Magill). "Each stone weighs 40·5 g. (the two together approximately

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF EPIDEMIOLOGY AND STATE MEDICINE.

AT a meeting of this Section held on March 28th Lieut.-Colonel F. E. FREMANTLE, the President, took the chair, and Dr. WILLIAM FLETCHER opened a discussion on

TYPHUS-LIKE FEVERS OF UNKNOWN ÆTIOLOGY,

with special reference to the Malay States. He remarked that the League of Nations, in their Epidemiological Report for December, had stated that typhus was the least interesting of all the infectious epidemic diseases, implying that everything was known about it and that it did not interest the research student. It was hard to believe that such an opinion could be entertained by anyone who had seriously investigated the many unsolved problems of the disease. He began by describing his own experience of the exanthem which in Malaya was called tropical typhus. Some six years ago he had seen a Sikh woman and her daughter, aged 11; they had been in hospital for about a fortnight and were lying in a drowsy typhoid state. He had examined the blood with his stock culture of *B. proteus* X 19; this strain had been thought at the time to be an ordinary culture of X 19, but was now known as the "K" or Kingsbury strain. The blood of the mother had agglutinated this strain in a dilution of 1 in 3000, and the daughter's blood at 1 in 1600. He had reported, to the great horror of the medical officer of health, that the patients were suffering from typhus fever. The diagnosis had been vehemently questioned, because it had been supposed that there was no typhus in the country, the patients had lived on an isolated farm, they had been well on the way to convalescence after the 17th and 18th days respectively, and the disease had not spread to the other inmates of the rather overcrowded general ward. Other cases of the same kind had subsequently occurred in various parts of the country. The symptoms were those of mild typhus and the rash in Europeans was like the rash of typhus, but in the dark-skinned Asiatics was difficult to detect. The agglutination with the K strain became positive towards the end of the second week of illness, reached its highest titre at the beginning of the fourth week, and then declined. The cases were always sporadic, and had no connexion with one another except where a common source of infection was suggested. The disease never spread in hospital. Body lice were not found, and there was plenty of evidence that the disease was not carried by head lice. It did not occur among town-dwellers, but affected those whose work took them into waste land covered with scrub and long coarse grass.

Serological Distinctions: Classification.

A number of cultures of *B. proteus* X 19 had been found, to the surprise of the workers, to differ antigenically and in their biological reactions from the K strain; moreover, they had not been agglutinated by the blood of these patients. The disease was clearly not typhus, because it did not spread from case to case and because the Weil-Felix reaction was negative with the ordinary strain of X 19. Nevertheless it must be closely related to typhus because of its positive agglutination with a strain of *B. proteus*. Cases had later begun to appear which gave a positive Weil-Felix reaction with normal X 19. Clinically they differed little from the others, but they all occurred in townsfolk. Shopkeepers were so liable to the disease that it had been given the name of tropical shop-typhus, in order to distinguish it from the other form, which was called tropical scrub-typhus.

Scrub-typhus had a patchy distribution and clung to certain estates and pastures; on plantations it was more or less limited to the older parts. The chief sufferers were the coolies who worked in close contact with the palm-trees. When palms were five years old these workmen had to hack off the lower fronds and dead flowers, which seemed to be the source of the infection. The resemblance of scrub-typhus, both in its epidemiology and in its serology, to Japanese river fever (tsutsugamushi disease) made it possible that the vector was a trombicula and that the reservoir of the virus was probably a rat. The ears of rats caught on the estate, where many of the observations were made, usually carried *Trombicula deliensis*.

Tropical shop-typhus was also a sporadic disease which did not spread; although it was not louse-borne its occurrence in towns and its positive Weil-Felix reaction showed that it was more nearly related to typhus exanthematicus than was scrub-typhus. It was probably identical with the endemic typhus of South Australia and of the United States (Brill's disease). There was little evidence to incriminate any particular arthropod.

Typhus-like diseases similar to those of Malaya occurred in many parts of the world. The spotted fever of the Rocky Mountains and the Japanese river fever were closely related to typhus exanthematicus. J. W. D. Megaw had classified all these diseases according to their vectors into the four groups of louse-typhus, mite-typhus, tick-typhus, and typhus-like diseases of which the vector was unknown. The Malayan forms fell into the fourth category. Diseases of this last class occurred all over the warmer parts of the world and, where there was seasonal variation, occurred chiefly during the hotter months. It must not be supposed that they were all different diseases, but they could not all be one disease. At present they fell into the two main groups of urban and rural, but as their vectors were discovered they would probably be transferred one by one into the first three classes of Megaw. If they occurred in England at all, they must be rare and very difficult to diagnose from true exanthematic typhus.

The PRESIDENT pointed out the necessity of facing the fact that the diseases Dr. Fletcher had described did not fit into the recognised text-book knowledge. The old ideas, valuable in their time, were giving place to more human conceptions. He recalled an epidemic in the Boro, in his early days of a disease which had probably been identical with one of the newly discovered syndromes.

Nomenclature.

Dr. E. W. GOODALL, as did nearly all subsequent speakers, repudiated the statement in the League of Nations' report that no one was interested in typhus. He pleaded for nomenclature by prominent symptoms and objected to the terms "scrub-" and "shop-" typhus. If these conditions were not typhus, they should have names describing what they were like. Mild forms of classical typhus occurred both sporadically and in epidemics. He suggested for all these typhus-like diseases the name "typhus minor." The Marseilles disease, however, had been shown by workers on the spot not to be typhus, at least clinically, nor was the Japanese river fever typhus, judging from Dr. R. G. Archibald's account of it (The Practice of Medicine in the Tropics).

Dr. Fletcher had distinguished his tropical forms from classical typhus by their mildness, non-infectivity, different seasonal incidence, different social incidence, their propagation by some means other than lice, and their serological reactions. Dr. Goodall adduced variola minor as an instance of a mild form of a well-known disease; moreover, the epidemic typhus of Australia, one of the diseases which Dr. Fletcher had enumerated, had recently shown a 10 per cent. death-rate, one quite up to the standard of true typhus. True typhus had occurred in this country without spread over and over again. Scarlatina

was most prevalent in this country in the early winter and in the United States in the early spring, but the disease was the same in both countries. Typhus, according to Crichton, had occurred among the higher as well as the lower classes, and Dr. Goodall had seen a small epidemic among well-to-do persons in Stepney whose house had been exceptionally clean. He had observed cases in which he doubted very much whether the disease had been conveyed by insects at all. Finally, serological anomalies might occur in homologous diseases.

The Causal Organism.

Sir ANDREW BALFOUR recalled a case occurring in a British soldier in Khartoum, of what had possibly been one of the forms described by Dr. Fletcher; it had been different from typhus but had answered very closely to the description given by A. Conor and A. Bruch of what was now supposed to be the same as the Mediterranean *fièvre exanthématique*. It had been mild and had had the peculiar clinical feature that the rash had occurred on the palms and soles as well as, slightly, on the face. The best example of a disease carried by a number of vectors was the tularæmia of rabbits, which might be conveyed by ticks, fleas, and other arthropodes and which had been found in Japan, Soviet Russia, and other places besides America. Its wider incidence, like that of typhus, had remained unrecognised until it had been pointed out by an especially shrewd observer. While agreeing with Dr. Goodall that topographical nomenclature might be misleading, Sir Andrew held that scrub-fever and shop-fever were useful terms until more was known about these forms. The chief difficulty was lack of knowledge of the ætiology. He had himself always been doubtful whether rickettsia was the active organism of typhus. The current number of the *Marseilles Médicale* had contained a paper on a case of Mediterranean typhus where dog ticks had been suspected as the vector. He welcomed the investigations which Dr. A. Anigstein, of Warsaw, was making in Malaya for the Colonial Office.

Dr. J. A. ARKWRIGHT testified to the value of the study of the rare forms of typhus for the elucidation of the whole question. Recent workers in the United States had found rickettsia to be commonly present in guinea-pigs and rats inoculated with European and Mexican typhus and the sporadic typhus of the South-Eastern States; the organism had been successfully transplanted into *Pediculus corporis*. This result would suggest that rickettsia was really the ætiological organism of typhus. Cross-immunity experiments in rats seemed to have established the identity of the sporadic typhus of the United States with European typhus, and the blood of sporadic cases had been passed through lice. If *Pediculus capitis* could convey typhus, the whole course of transmission would be different. The apparent absence of lice on a patient was not conclusive, as a single louse could infect.

Prof. J. C. G. LEDINGHAM saw in the results with the Kingsbury strain a promise of further enlightenment on the bacteriology of the new forms. Dr. Goodall's objection to the nomenclature did not seem to him important. The observation of small clinical differences would not help much, and progress must be along bacteriological lines. When progress had been made, correct nomenclature would follow.

Serological Tests.

Dr. A. FELIX described Dr. Fletcher's work as one of the most important advances made in the study of typhus during recent years. He had fully confirmed Dr. Fletcher's results by serological tests. The K strain undoubtedly played the same rôle in the rural typhus as *B. proteus* X 19 played in the urban and classical forms. Two strains of *B. proteus* had been used from the earliest days of the serological diagnosis of typhus, and antigenic analysis had shown that the relationship of the K strain to the known types was similar to that which existed between the two early types. Failure to obtain cross-immunity between a typhus-like disease and true typhus might be due to antigenic factors known in other bacterial species, and could not by itself support a distinction.

Sir WILLIAM HAMER said that in epidemiology the question always arose of what the orthodox disease was, and epidemic diseases unfortunately did not behave in a very precise and orthodox manner. He had been struck years ago by the difficulty of distinguishing in some cases between diphtheria and scarlet fever, and had learnt from Dr. Goodall that there was no such thing even as an orthodox measles rash. It was necessary to take account of all the bacteriological and clinical evidence, the various facts of meteorology, and the incidence in scrub or shop, and then to return to the epidemiology of the disease. Even before the middle of the last century writers had had very definite ideas about the epidemiology of these comatose fevers, and Sydenham had grouped them on either side of the big influenzas. Typhus fever, whether in Dr. Fletcher's cases, in those studied by Dr. Goodall in Poland, or in those observed after the big influenza epidemics of the 'nineties, had certain epidemiological characters that were world-wide and had extended over centuries of time. These characters ought to be weighed together with all the other evidence.

Dr. J. D. ROLLESTON referred to the valuable work done in Germany, which had established that typhus was really a disease of the small arteries, and asked Dr. Fletcher whether the typhus nodules were found in his cases. He criticised Dr. Fletcher's suggestion that exanthematic typhus might be a comparatively modern disease. Typhus was a disease of human misery, associated with war and famine, and he thought it very probable that the Athenian pestilence described by Thucydides had been typhus. He asked whether any work had been done on prophylaxis with the serum of convalescents. A paper had recently been published by Pecari which probably threw light on the Italian *febbre eruttiva;* the author had said that it existed in Rome, and it therefore appeared to be an urban form of the disease.

Reply.

Dr. FLETCHER, in reply, said that Brill had decided shortly before his death that his disease (endemic typhus of America) was not typhus. Hundreds of cases of the kind he had described occurred without spread in different parts of the world and epidemiologically were not typhus. Moreover, the public would not have them called typhus. Dr. Goodall had said that the Mediterranean disease was not typhus, but there was a disease at Toulon which occurred on the ships and in the streets, which gave a positive Weil-Felix reaction, and which was different from the Marseilles type. He had classed the particular Marseilles epidemic he had referred to with the Japanese river fever because the symptoms were very much the same and there were similar changes in the small blood-vessels and agglutination, though only in a low degree, with the K strain. Typhus inoculation in guinea-pigs conferred slight immunity against Rocky Mountain fever, and the positive Weil-Felix reaction in Rocky Mountain fever had justified Megaw in classifying it with typhus. The names he gave to these diseases were simply provisional. In New York and Australia Brill's disease was not notifiable and was not treated as typhus. Dr. Anigstein would probably publish his work shortly. Cross-immunity did not mean that the virus causing two diseases was necessarily the same; he instanced variola and vaccinia. He did not think that head lice were concerned, because their presence or absence seemed to make no difference to the spread. He agreed that the epidemiological aspect was the most important. He had not gathered that the disease described by Pecari had actually occurred in a town. No attempt had yet been made to immunise with convalescent serum. Such histological material as he had seen resembled that of typhus.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

At the meeting of this Society on March 28th, Dr. FRANCIS J. H. COUTTS, the President, being in the chair, the subject of discussion was

VULVO-VAGINITIS IN CHILDREN.

Dr. D. KATHLEEN BROWN, in opening, based her remarks on the experiences she had gained at the Guy's Hospital V.D. Clinic and the Children's Medical Home, Waddon. In the former, between the years 1925 and 1929, the number of new cases of gonococcal vaginitis was 118. Of these, 46 were discharged cured, 16 were transferred to other hospitals or for further tests, 8 ceased to attend, and 48 were still attending. The 46 patients who remained under observation to the completion of the treatment, including tests for cure, attended for an average period of 67 weeks, the longest time being 204 weeks. At the Children's Home the duration of the disease varied from a few weeks to two years. In 21 months at this establishment 84 patients were admitted with gonorrhœa, and 1 with syphilis; 55 were discharged after treatment, 24 were still resident there. The incidence of gonorrhœa in children for the five years at the Guy's clinic was 12·5 per cent. of all cases of female gonorrhœa. With regard to non-gonorrhœal vaginitis, 174 children attended for examination because of discharge from or soreness of the vulva, or because they were contacts with infected parents or sisters. In most of these cases the infection was due to the streptococcus, staphylococcus, *B. coli*, or the Klebs-Löffler bacillus. Dirt and thread-worms were also a cause of vulvitis; and in some patients there were excoriations and impetigo. The ages of the cases varied from 10 months to 12 years, the average being 4·6 years. At Guy's Hospital clinic there were no cases between the ages of 12 and 15 years. Relapses seemed to occur most often in hot weather.

Modes of Infection.—In a large proportion of the cases the source of infection could not be traced, but accidental transmission by the use of infected towels, sponges, sheets, lavatory seats appeared to be most common. A large number of the infected children had parents with gonorrhœa. When epidemics occurred in institutions the spread of the disease was rapid, probably by the use of infected bed-pans or lavatories, towels, and sponges; possibly by clinical thermometers or syringes. In this country assault was not a common cause of infection. At Guy's the sources of infection were as follows: of unknown or doubtful origin, 67 per cent.; ward infection, 15 per cent.; parents who were gonococcus-positive, 13 per cent.; assault, 4 per cent. Parents and sisters of infected children should always be examined where possible. In the 84 admissions to the Children's Home already mentioned, the accidental or unknown origins were 58 per cent., infected from parents 31 per cent., assault or probable assault 11 per cent. Of 70 cases at the Guy's clinic 61 per cent. had gonococci in the vaginal smear at the first attendance. Of the 39 per cent. with negative reports at first, 24 became positive at a later stage, usually in a few days, though in one case the positive result was deferred for nine months. This emphasised the need for repeated tests before excluding gonorrhœa. Vaginal cultures gave a considerably lower percentage of positive results than the smears. In acute cases the gonococcus was always demonstrable in both vagina and urethra.

The points in the *diagnosis* were excoriation of the groins and of the labia majora, with adherent crusts of dried pus, an acutely inflamed vulva bathed with pus, inflammation and œdema of the urethral orifice and hymen, with thick, creamy pus oozing from the vagina with the child's expulsive effort. The frequent absence of actual symptoms might account for the delay often noted in bringing these children for treatment; and yet it was quite usual for the affected child to scream when micturating. Dr. Brown expressed regret that many practitioners still failed to appreciate the danger, and did not fully investigate cases of discharge in children. The acute symptoms cleared up with treatment, but the length of time before negative reports were obtained varied a good deal with different cases. In the two series dealt with the minimum period was two weeks, the maximum 15 weeks. One of the features of the disease was the tendency to relapse; 54 per cent. of the cases mentioned here relapsed.

Complications were less frequent in children than in women. The Guy's cases showed urethritis, 12·2 per cent.; proctitis, 4·6 per cent.; gonococcal infection of the eye, 3 per cent.; pelvic peritonitis, 1·5 per cent.; arthritis, 1·5 per cent. During treatment the general health was maintained by tonics or cod-liver oil, and home treatment was carried out by Sitz baths. Three forms of treatment were used: (1) spuman, either alone or with 10 per cent. protargol in glycerin; (2) mercurochrome 10 per cent., emulsion of sulphur, or acriflavine 2 per cent.; (3) irrigations with potassium permanganate 1 in 10,000, or with other solutions.

Experiences at Great Ormond-street.

Dr. B. B. SHARP dealt with his experiences at the clinic of the Hospital for Sick Children, Great Ormond-street, under Dr. D. Nabarro from 1923 to 1929, and with the cases seen in the department from 1917 to 1929. Cases of inflammation of, or discharge from, the vulva investigated amounted to 1219 and of these 249 had definite gonorrhœa; 949 were not of that nature, 21 were returned as doubtful. Often evidence could be obtained that a parent passed the disease on to the child. He agreed that acute gonorrhœal vulvo-vaginitis could be clinically diagnosed, almost with certainty in every case. Usually the organisms could be seen to be intracellular, though in the very early stages they might be extracellular. In older patients difficulties of diagnosis often arose. Bacteriological tests must be continued over a considerable time before the patient could be regarded as cured. Many other organisms could mimic the gonococcus in smears, but they varied in size, and the skilled pathologist could differentiate them. To be able to grow the gonococcus proved the diagnosis, but that was not easy in the primary culture. He had found blood serum agar to be the best medium. An analysis of cases showed the age-incidence to be between 2 and 5 years; after 5 the incidence declined rapidly. In adult women the highest incidence of the disease was in the summer months, perhaps because of the increased opportunities of infection in the warm evenings. He agreed with Dr. Brown that in this country criminal assault as a cause was very rare. Prophylaxis depended on a proper education of infected adults, who should be warned of their liability to infect female children. Any of the contiguous orifices could be infected. Since March, 1926, he had carried out rectal tests as a matter of routine, at an earlier stage than urethral tests. As to treatment, for the first week he accustomed the child to one daily irrigation, afterwards using a douche of permanganate 1 in 4000, or dilute milton; the vagina was then packed with some antiseptic plus glycerin, his preference being protargol. Any rectal infection he treated with a 2 per cent. aqueous solution of protargol. None of his rectal infections had persisted. He did not consider a case cured until the smears continued to be negative three months after the child's return home. Cases of non-gonorrhœal vulvo-vaginitis were very numerous, and he only dealt with them in a general way. The age-incidence in these was older than in the gonoccocal—namely, 5 to 10 years. It was difficult to find any seasonal incidence; these cases were often very chronic and there was a great liability to recurrence. If, as some believed, this form was

more frequent in July, August, and September, it was probably because of the scanty underclothing worn, and the more frequent sitting on dirty door-steps. The wearing of tight combinations might lead to irritation sufficient to start the habit of masturbation; there might be eczema, glycosuria, hyperacidity of urine, or accumulation of smegma. Poor health, especially in the highly strung child, was a contributory factor. In girls approaching puberty pure diphtheroid infections occurred.

Dr. DAVID NABARRO said he noted that Dr. Brown had dealt with several female children under a year old. From 1917 onwards if he, the speaker, had a case under 2 years of age sent to him, he took it as presumptive evidence that it was not gonorrhœal. But when, at a later date, cultures were done as a routine, gonorrhœal cases proved to be more numerous than he had thought them to be. As to involvement of the eye in the disease, Dr. P. Flemming had demonstrated that the secretions of the eye, at least in the adult, were decidedly bactericidal, the material being lysozyme. It might be that this was not present in the eyes of infants. There was a question whether there might be different strains of gonococci, as there were of streptococci. That might explain why one did not get positive fixation tests unless a polyvalent antigen was used. At his hospital they had not had very successful results from vaccine treatments, several kinds of which had been tried. Prof. Ronenger favoured intramuscular injections of sterilised milk, three or four injections materially shortening the period of treatment. In none of the cases with which his department was concerned were pneumococci present. More hospital beds for these cases were needed and would result in a definite shortening of the treatment. Four cots were set apart for them at Great Ormond-street, and they were always occupied.

Dr. T. ANWYL DAVIES said he had always found that if the accompanying proctitis was left alone it cleared up. His most satisfactory results had been in cases in which glycerin entered into the treatment. He had found more positive results from cultures than from smears, even among children. In 44 per cent. of his cases the infection was found to have been transmitted from the mother.

The Technique of Nursing.

Colonel L. W. HARRISON said he would like to enter a plea for the careful training of nurses in charge of children in a ritual designed to prevent infection being passed from one child to another. In some outbreaks of this disease into which he had made inquiries it seemed to him that nurses had not realised how easy it is for infection to be passed from one patient to another on such articles as thermometers, towels, chair-seats, and so forth. Every female child ought to be regarded as a potential danger to its neighbours, notwithstanding negative swabs. He would like to make a suggestion with regard to treatment. In the douching which was usually carried out in these cases, it seemed to him that often enough the lotion did not penetrate to the furthest recesses of the vaginal canal, merely surging in the lower reaches. He would suggest that a more efficient douching would be carried out by means of a back-flow instrument passed to the vault of the vagina. He was not very unhappy to find that the painting with mercurochrome, which he had suggested some years ago, had not altogether fulfilled the hopes he had entertained, but he was glad to find that the treatment with glycerin applications, which he advocated a number of years ago for gonorrhœa in the adult, had given such good results in children.

Gold Compounds.—In Dr. W. N. Goldsmith's remarks reported last week (p. 692) after triphal *read* aurophos and lopion.

ST. JOHN'S EAR HOSPITAL, MANCHESTER.—Last year there were 2366 new patients, and 406 operations. There is a long waiting-list.

Reviews and Notices of Books.

SURGERY OF THE LUNG AND PLEURA.

By H. MORRISTON DAVIES, M.D., M.Ch., F.R.C.S., Medical Superintendent, Vale of Clwyd Sanatorium. London: Oxford University Press, Humphrey Milford. 1930. Pp. 335. 25*s*.

THIS work, which is published as a volume for a monograph series entitled "Regional Surgery" under the general editorship of Mr. A. P. Bertwistle, is essentially a revised edition brought up to date of an excellent book with the same title published in 1919, and has remained an authoritative English text-book on the subject. Intrathoracic surgery has progressed during the last ten years in a way that may be compared with the advances in abdominal surgery a generation ago. It is possible safely to open the thorax and operate on a growth or suppurative condition in a patient for whom nothing could have been done a few years ago. Even in the treatment of empyema surgical procedure has undergone a complete revolution, and the mortality, under modern surgical technique, has been considerably lessened. In this book the author discusses the dangers of an open pneumothorax; he explains why aspiration is safer than early operation in many types of empyema, and when operation should be undertaken. It is possible to operate too late as well as too early. In dealing with abscess of the lung the danger of rupture into the pleural cavity is emphasised; artificial pneumothorax is rarely justified. The operation of rib resection and drainage is described. Under modern technique the results of this procedure are excellent. The dangers of lobectomy have also been greatly diminished; in recent years it has become possible to remove a lobe of a lung containing a malignant tumour. Lobectomy may in time become the operation of choice, supplanting thoracoplasty in such conditions as bronchiectasis. In pulmonary tuberculosis the advantage of resting the lung has long been appreciated. The author describes four methods of collapsing the diseased lung: (1) Artificial pneumothorax—the method of choice, but its success is limited by the presence and extent of intrapleural adhesions; (2) thoracoplasty; (3) extrapleural pneumolysis; (4) phrenic evulsion. These and other operations are described in detail, as are also the methods of producing regional anæsthesia. The book will be read with the greatest interest by the physician as well as the surgeon interested in intrathoracic disease, for, as the author points out, medical and surgical treatment must go hand in hand and cannot be considered separate entities. The author is to be congratulated on this work. The arguments are clearly expressed and well arranged and a very complete list of references is appended.

A SHORTER SURGERY.

Second edition. By R. J. MCNEILL LOVE, M.B., M.S., F.R.C.S., Assistant Surgeon, Metropolitan Hospital. London: H. K. Lewis and Co., Ltd., 1930. Pp. 371. 16*s*.

Mr. Love has here reduced surgery to its simplest terms. He has omitted controversial matter and irrelevant hypotheses, and now, by adding chapters on specific diseases, fractures, and dislocations, he has filled a few gaps noticeable in the first edition of this useful book. Text-books providing short cuts to the learning of surgery frequently defeat their object by excessive condensation. They become little more than lists which are so tedious as to make little impression upon the mind of the reader. This book is not at all dull and the student who has read a larger text-book or assiduously attended classes of clinical instruction has now at his disposal a small volume which will remind him of all the salient facts which he should have remembered from his former studies. It is an achievement to have compressed in such a small compass a readable account of modern surgery.

THE DRAMATIC IN SURGERY.

By GORDON GORDON-TAYLOR, O.B.E., M.A., F.R.C.S., Surgeon to the Middlesex Hospital. Bristol: John Wright and Sons, Ltd. 1930. Pp. 88. 12*s.* 6*d.*

THIS attractive little book will afford an hour or two's entertainment to the practising surgeon, with some profit. It comprises the substance of an address delivered before the Manchester Surgical Society. Some almost incredible exploits by the author and other surgeons are recounted, which will fill the reader with astonishment, but their memory will encourage him in future times of difficulty and doubt. One lesson stands out emphatically—that success in cancer surgery comes only to him who dares. Many incidents are related which are dramatic or curious or even humorous mainly from the circumstances or surroundings in which they have occurred, as for example the rupture of a hydrocele when its possessor, a Scotchman, stooped to pick up a sixpence lying in the Charing Cross-road. The book must be read to be appreciated. It will be laid down with a feeling of regret that a gifted author of such varied and ripe experience does not more often contribute to surgical literature. The illustrations are many and beautifully executed.

THE BLOOD PICTURE AND ITS CLINICAL SIGNIFICANCE.

Seventh and eighth revised editions. By Prof. Dr. VICTOR SCHILLING, Physician-in-Chief, the First Medical University Clinic, Charite, Berlin. Translated and edited by R. B. H. GRADWOHL, M.D., Director of the Pasteur Institute of St. Louis. London: Henry Kimpton. 1929. Pp. 408. 42*s.*

THIS book was first published in Germany in 1912. Its eighth edition, which has been translated, is not a very impressive production. The main theme deals with the author's modification of the Arneth system in determining the response to infection, but it is noteworthy that the two writers appear to be on terms of lively disagreement. There are four parts, the first dealing with technique. A particular method of making blood smears is given, with many methods of staining, some rather vaguely described. A thick drop is always made to show the degree of polychromasia, the proportion of eosinophils and the presence of parasites. The hæmoglobin must be estimated, but the total red and white counts are only done when it looks necessary; otherwise the leucocytes are estimated from the smear. The usual special examinations —e.g., fragility, platelets, &c.—are described, with the additions of the sedimentation-rate and gutta-diaphot. The latter device does not sound attractive; it is admitted that its use is still mainly in the experimental stage, and the insertion of a description of it in this book savours of advertisement. The notes on blood transfusion are poor—for example, an enema of blood is suggested for small children.

Part II., called the theory, morphology, and division of the blood picture, first describes the red cells and the anæmias which are classified according to the degree of "shift to the left," normoblastic, megaloblastic, and so forth, either purely regenerative —i.e., with normal young cells—or with some degenerative tendency as well. The classification is not always very fortunate—e.g., in severe aplastic anæmia with little or no shift. The blood-platelets are discussed with the red cells from which the author considers they are derived. A longer section is devoted to the leucocytes, the determination of the response to infection being the main raison d'être of the book. The "hæmogram," or blood picture, includes normally an estimation or count of the totai leucocytes, an examination of the thick drop, and the differential count. The latter is of the usual type, apart from the neutrophils which are divided into four groups: (1) segmented cells, (2) "stabs," (3) juvenile cells, (4) myelocytes. The "stabs" or "staff" cells have nuclei in the form of bent rods and serve as an index of the degenerative tendency present, while the appearance of juvenile forms or of myelocytes shows the degree of regeneration activity. Even if one assumes that the different types can be accurately differentiated, it is clear that a very high standard of technique and judgment would be necessary in any establishment where large numbers of routine blood counts are made. The importance of the eosinophils in infection is very rightly stressed, and the interdependence between the different types of leucocytes is suggested. The discussion on the leukæmias is comparatively short, and it is curious that the author should stress the use of the oxydase test, since he admits that it may be negative in the myeloblast. The blood in the child is discussed in a separate section.

Part III., on the clinical use of the blood picture, includes the changes in specific diseases, and Part IV. is devoted to 100 examples of actual cases. The cases of tuberculosis ought best to show the use of the hæmogram, but unfortunately the prognosis is not always confirmed by any subsequent history.

In general the book is far from convincing, and is written with little critical sense. The translation is too liberal, the terminology being flowery and the meaning often obscure. Four well-executed coloured plates are included and the index is very full; a large bibliography refers almost exclusively to German publications.

BIOLOGIE UND PATHOLOGIE DES WEIBES.

Ein Handbuch der Frauenheilkunde und Geburtshilfe. Lieferung 46, VIII. Band, 3 Teil. *Die Beeinflussung der Geburt durch den spontanen vorzeitigen Blasensprung.* Von Priv.-Doz. Dr. E. FREY (Zurich). Berlin: Urban and Schwarzenberg. 1929. Pp. 1903–2072. With 6 coloured plates. M.10.

IN this subsection of Halban and Seitz's well-known work Dr. E. Frey, of Zurich, deals very comprehensively with the subject of premature rupture of the membranes, discussing its causation and influence on labour and the puerperium in normal and in contracted pelves. For purposes of comparison standard tables have been constructed from records of 200 cases of normal labour and the puerperium in primiparæ and a like number in multiparæ. Such a detailed study has been rendered possible by the fact that in Zurich "pain tables," showing the number and duration of labour pains during each half-hour of labour, have been carefully kept since 1926. These "pain tables" show the number of pains necessary to complete the first, second, and third stages, the duration of the various stages, the amount of blood lost, and so forth, and a comparison is made with the results in 400 cases in which the membranes ruptured prematurely—that is, before the onset of pains. As to management, the author advocates hospital care for all such cases and an expectant attitude with avoidance of vaginal examination. Hydrostatic bags find no favour and induction of labour by ecbolics or otherwise in the stage between rupture of the membranes and the onset of pains is deprecated. Judgment is reserved on manual dilatation when there are signs of fœtal distress. Although reference is made to the unfavourable influence on the fœtal mortality-rate it is disappointing to find no reference to the work of Warnekros and others on the frequency of placental infection when the membranes have ruptured prematurely, and to the consequent occurrence of maternal blood-stream infections, nor is there any note of British and American work on congenital infection of the fœtal lungs.

Prof. W. H. Taliaferro's "Immunology of Parasitic Infections," reviewed in our last issue, is published in this country by Messrs. John Bale, Sons and Danielsson, Ltd., price 26*s.* post free.

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THE LANCET.

LONDON: SATURDAY, APRIL 5, 1930.

THE PHARMACIST AND THE REPORT.

THE publication of the report of the Departmental Committee on the Poisons and Pharmacy Acts, of which a general survey was made in our issue of March 22nd (p. 633), had been awaited by pharmacists with impatience commingled with a certain amount of anxiety. This anxiety has, for the most part, been allayed by the presentation of the report, but there can be no doubt that pharmacists as a body would prefer the status quo to be preserved. In a few years from now the Pharmaceutical Society of Great Britain will be celebrating its centenary. It was in the early days of Queen VICTORIA'S reign that a number of chemists and druggists met together at an hostelry in the Strand and resolved, on the motion of WILLIAM ALLEN, F.R.S., to form an Association for the purpose of protecting their permanent interests and—as it was quaintly put—of increasing their respectability. Less than two years from its foundation the Pharmaceutical Society was granted a charter of incorporation; quick work indeed, but it is to be recalled that the same WILLIAM ALLEN was instrumental in satisfying the Duke of KENT'S creditors, and so contriving that the future sovereign should be born in the country over which she was destined to rule. Even so all was not plain sailing, and in our own columns appeared a warning of the supposed intention of the Society to sue for a charter and an advice to the Apothecaries Society to apply to the Privy Council before it was too late. The misunderstandings of ten decades back have long since been cleared away, and the Society has performed its duties honourably to the good of all concerned. What, then, is wrong with existing conditions, and why was the inquiry started? No charge of inefficiency had been laid against the Society, and there was no suggestion that the Pharmacy Acts were being administered improperly. Current stories of dope fiends and cocaine traffickers may have impressed the Government of the time, but there was nothing in the terms of reference to the Committee which had any bearing on the illicit traffic in narcotic substances, and there is certainly nothing in their report which would embarrass either the west-end charlatan who deals in "snow," or the Chinese keeper of an opium den. The cause of the inquiry remains obscure to the pharmacist. For 90 years the Pharmaceutical Society has been a voluntary body, and at the present time, to quote the figures in the report, there are 12,500 members, while 20,000 are eligible for membership. No pressure, except by way of gentle suasion, is brought to bear on registered chemists to join the Society, and the only means by which a chemist can show that he is a member is by displaying his certificate in his shop or by using the letters "M.P.S." after his name, if he so chooses. It is a remarkable testimony to the camaraderie of the pharmaceutical profession and to the confidence it has in the Society that such a large proportion of those eligible for membership should pay a guinea and a half a year, when there is nothing stronger than a sense of loyalty to impel them to do it.

The Departmental Committee proposes to change all this; instead of volunteers we are to have conscripts and there is to be no loophole for the conscientious objector. From this principle there will be many dissentients, and they will be derived not only from the 7500 who at present benefit from the work of the Society without contributing to it, but also from the ranks of those who have supported the parent body because they considered it their duty to do so. In addition to compulsory membership of the Society, it is proposed to compel every person who owns a chemist's shop to pay a registration fee in respect of it. The maximum fee for membership is raised to £2, and the maximum fee for registration is £3. Thus, supposing the fees in each case were fixed at the highest figures, chemists owning single shops would be required to pay £5 a year, which, in the case of those chemists who do not now subscribe to the Society, would be a new charge; in the case of those who are members of the Society there would be a compulsory charge of £3 8*s.* 6*d.* in excess of the amount which they now pay voluntarily. A trifling calculation based on the figures given in the report shows that the Society's revenue from membership and registration fees would be £70,000, which, assuming that the present revenue from members' subscriptions is £21,000, would mean an addition of nearly £50,000 to its annual income. If such a proposal appears fantastic, there are two factors which must enter into the calculations. In the first place the amounts of the fees for membership and for registration are to be prescribed by by-laws of the Society; the maximum fees only are laid down in the recommendations of the Committee, and there is nothing to prevent the members of the Society, who elect the governing body, from so limiting the fees that the income from the two sources will not be greater than the present revenue from members' subscriptions. Thus it would be quite possible, though obviously not practicable, for the membership fee to be reduced to 15*s.* a year and the registration fee to be fixed at 7*s.* 6*d.*, without loss of income; in such a case the present members would be in pocket to the extent of 9*s.* a year. In the event of the Bill which the Committee have drafted becoming law in its present form, the Society could be depended upon not to abuse the extraordinarily generous openings which the Committee propose to give them. The other factor is the increased cost entailed in the administration of the proposed new Act. While the onus of prosecuting offenders would be removed from the Society except as a "common informer," it would be charged with the duty of inspecting registered premises, and in proposing a registration fee the Committee had in mind the cost of this inspection. Further, it is clear that the addition of 7500 registered chemists to the membership list would entail a heavy cost, for clerical work and circularising alone would mean a substantial additional charge. The question of increased revenue is bound to be attacked when the Bill is debated in Parliament, for it will be argued by various trading bodies, which are jealous of the chemists' so-called privileges, that the revenue-raising powers with which it is proposed to endow the Society are too great. Were not the integrity of the Society itself a sufficient safeguard, it can hardly be seriously imagined that the members who, through

their elected representatives, make the by-laws, would consent to the imposition on themselves of heavy burdens, even though they feel, as they could feel, that the funds of the Society would be used for the advancement of pharmacy on a scale even more generous than in the past.

Turning to the administration of the law affecting the sale of poisons, the pharmacist will note that, whereas in the past the Society has been its own policeman, it is now proposed that the functions of prosecuting offenders should be handed over to the proper authority for dealing with infringements of the law. Such a proposal was inevitable as soon as an inquiry started, for although the Society has performed the functions of prosecution, judge, and jury for all these years with vigilance and justice, the system is out of tune with modern methods. Moreover, under existing conditions, the penalty for the offence in the majority of cases is an unalterable fine, and the offender is able to pay the penalty without incurring the more effective correction provided by publicity. The difference between the existing state and that proposed is the difference between a caning at home and sitting in the stocks, and while offenders would prefer to receive a demand by post for £5 rather than a summons from the hand of a policeman, it is frankly impossible to raise any logical objection to the proposed change. Some of the older members of the Pharmaceutical Society may regret the suggested intrusion of representatives of the Government into the domestic circle of the elected council. It is true that the Society's council and that august body, the Privy Council, have rubbed shoulders from the very beginning, but one may be friendly with a man without asking him home to dinner. The proposal, however, is in keeping with modern developments, and as it is impossible by any known method for a minority to outvote a majority, it is difficult to foresee that the presence of three nominees of the Privy Council will have any baneful influence on the 21 councillors elected by the members of the Pharmaceutical Society. In quite a different category is the contemplated constitution of the "Poisons Board," which is something entirely new in pharmacy legislation. It is to consist of 14 or more members, of whom only five are to be appointed by the Society, and its duties will include the drafting of two lists of poisons; the sale of those in the first list will be restricted to registered chemists, but those in the second list may be sold not only by chemists, but by any person licensed for that purpose by a local authority. Chemists will claim a larger representation on this Board, notwithstanding that the nominees of the Pharmaceutical Society, together with those of medical bodies, will have a majority of two over the other members, unless the Home Secretary exercises the privilege of appointing four additional members. Hitherto the initiative in deciding what is a poison within the meaning of the Acts has been vested in the Society, and the change projected—namely, to give them only five-fourteenths of a voice, is so fundamental that it cannot go unchallenged. That, however, is an almost trivial matter compared with the encouragement which the recommendations, and Clause 16 of the Bill itself, holds out to potential vendors of poisonous preparations used for sanitary, industrial, horticultural, or agricultural purposes, or as sheep dips or vermin killers. As Mr. GAMBLE, whose association with a firm bearing the names of two of the founders of the Pharmaceutical Society is not without interest, says in his Minority Report: "any person will be able still more freely to purchase sufficient arsenical weed-killer to exterminate a village" if Clause 16 is enacted. To us it appears inconceivable that it will become law in the form laid down in the Draft Bill. Already more than ample provision for the sale of industrial and agricultural poisons is available under an existing law, and it would be an act of folly to compel local authorities to grant licences for the sale of such poisons to all applicants, excepting imbeciles or criminals. The shops of trained and educated chemists are to be subject to a regular system of inspection, one of the objects of which is to ensure that poisons are properly "stored." Is it not far more important in the interests of public safety that purchasers of sufficient poison "to exterminate a village" should be required by law to store their purchases with extreme care, and to allow an inspection of the premises in which the poisons are stored, whether in an outhouse or in the larder?

MALARIA CONTROL IN INDIA.

THERE is a tendency to associate roving commissions with pleasant little excursions under the most comfortable conditions at the right time of year, punctuated at convenient intervals with complimentary dinners. But that this is not always a true picture is shown in an account of an Indian tour made by the Malaria Commission of the League of Nations last October, in the Singhbhum district of Bengal; the story is told by Lieut.-Colonel R. KNOWLES, the Editor of the *Indian Medical Gazette*, who accompanied the Commission, in the January issue of the journal. The Commission started work at the height of the malaria season, and their tour was evidently a very strenuous one. There were representatives from the United States of America, France, Spain, Holland, and Roumania. The members adopted a common-sense working kit; a photograph shows them all dressed in shorts, with open-necked shirts, no coats, and of course the universal solar topi for head covering. Starting from Calcutta they were taken, in a special train as headquarters, through some of the most malarious regions in India, varying between the rice fields which are so characteristic of Bengal, and picturesque hill and forest scenery. Close to Calcutta they were shown numbers of good-class Bengali houses lying deserted, the causes of abandonment, apart from the natural drift towards the city, being largely malaria and kala-azar. Graphic accounts are given of the wretched condition of the inhabitants of small villages in the worst-infected areas, and of the sufferings of the engineering staff at the time of the construction of the railway, due to malignant malaria and blackwater fever, but it is admitted that in most of these rural areas control on anything like a wholesale scale would be out of the question on the score of expense. One site fixed on for an important railway station had to be abandoned. Infection of running crews in the mining district of Noamundi is avoided by keeping the trains up at the mine heads in protected areas until they can get a clear run through by day.

Colonel KNOWLES'S paper deals mainly with control measures at the Noamundi Mine, and, by contrast, at Dangoaposi railway station, through which passes an enormous amount of traffic connected with the mining area. The ground in the Noamundi region consists almost entirely of pure iron ore, which is worked from open quarries in the hillside. The chief source of malaria lay in innumerable seepages, and the bed of the river which they fed. This boulder-strewn stream

has been drained throughout the entire area, and every one of the seepages subsoiled—i.e., channels five feet deep and three feet wide are constructed, filled with boulders and covered with graded stones and earth. Neighbouring trees are dug out, and in that rocky ground it was necessary to use dynamite freely. Protective masonry walls were also built, when necessary, and everywhere seepage water has been led underground and delivered into the main stream through protected outlets. In short the entire hillside has been drained dry of water, thus constituting (with the addition of oiling where necessary, and the screening of all residential bungalows) the malariologist's ideal of a malaria-free enclave within a malaria-ridden district. A diligent morning's search for mosquitoes by one of the Commission yielded only a single chironomid. It is stated that Noamundi Mine is now free both from larval and adult anophelines, and that the only cases which occur are relapses. These measures have, of course, been immensely expensive, and could only have been carried out where wealthy bodies such as the large steel and iron companies were concerned. The expense incurred must, however, have been repaid over and over again in the diminution of the sick-rate, which might otherwise well have rendered work impossible, as in the early stages of construction of the Panama Canal. Just outside the enclave is a village of aboriginals, where anophelines still breed freely, and there is an intense malaria incidence. The problems involved in mosquito prevention in the mine area are so largely of an engineering nature that the work has been put in charge of an engineering officer. He has unlimited labour at his command, and as much dynamite as he requires.

Malaria at Dangoaposi station is a different problem altogether. There, as Colonel KNOWLES says, it is man-made, as in so many other cases in India. The main trouble was a lengthy storm water channel, which was badly constructed, and an incessant source of mosquito breeding, and numerous borrow-pits by the side of the line. Malaria was so prevalent in 1925 that the incidence of attacks amongst the running employees in September was 287 per cent. for that month, which meant that each employee had approximately three attacks. Engines lay idle, and the mineral traffic was almost at a standstill. Control was commenced in November, 1925. Only two main measures were possible—the filling in of swamps and borrow-pits and the creation of proper storm water channels, with regular oiling. These procedures have been very successful, and Dangoaposi is now said to present a malaria control almost as perfect as Noamundi, at the comparatively slight cost of six rupees per head per annum of the population. Mention is made of a very remarkable phenomenon in this neighbourhood: a pool formed by an old manganese quarry, the water of which is absolutely inhibitory to the breeding of mosquito larvæ. Not only do mosquitoes not breed in the pool itself, but the water when turned into an adjoining stream apparently sterilises it of larvæ, while experiments carried out with the same water in shallow pools have shown that it retains its larvacidal properties for three weeks. The water has been analysed, and there is nothing unusual in its chemical composition. Colonel KNOWLES comments on the invaluable opportunities which tours of this description provide for workers in different countries to compare notes with each other, and remarks that this visit has afforded a most useful stimulus for the local observers. He considers the Noamundi scheme of control one of the most complete and perfect in the world.

REFLECTIONS ON CROTCH v. MILES.

ON mere academic grounds the case of Crotch *v.* Miles (fully reported in the last two issues of THE LANCET) may be deemed regrettably inconclusive. Two serious legal issues were raised but not decided. To begin with, was not the claim barred by the Statute of Limitations? The plaintiff began proceedings just eight years after the surgical operation of which she complained; the statute says proceedings must be begun within six years. Here there was an ingenious rejoinder. The surgeon, it was argued, committed an act of trespass by leaving the forceps in the plaintiff's body (if the jury should decide that he did); this trespass continued till the removal of the forceps in 1928, so that the six-year period did not begin to run until this recent date. The defence of a statutory time-limit (important in the Harnett litigation and crucial in cases where the Public Authorities' Protection Act is invoked) is not a mere technical plea. The Statute of Limitations was passed to check the abuse of raking up stale claims, it being unfair that a defendant should be attacked at a date when, by reason of lapse of time, his power of defence is prejudiced. Crotch *v.* Miles illustrated the unfairness; a witness on whose evidence the defendant would have strongly relied had died in the eight years interval. How can a surgeon, physician, or dentist be otherwise than at a grave disadvantage if suddenly called upon to meet an attack based on something which happened eight years ago?

The other important issue in the case—the question of the respective liability of surgeon and theatre sister for the counting of forceps and swabs—is also left in the air. A definite ruling, given by the Court of Appeal of South Africa in 1924, was cited to show that it is a reasonable and proper practice to leave the duty of checking swabs to the theatre sister. In the South African case the surgeon had made a careful search at the conclusion of the operation and had relied upon the sister to count and check in accordance with the usual hospital practice; the Court held that, though the operating surgeon was bound to exercise all reasonable and proper care, he was in these circumstances not guilty of negligence in respect of one swab which was overlooked. If that is the law in South Africa, is it also the law in England? We do not know. The second question which the jury was invited to answer in Crotch *v.* Miles raised the issue of the surgeon's responsibility for the task entrusted to the sister, but the answer to the first question made further answers unnecessary. Something like the same issue arose in a hot-water bottle case not long ago. Are the legal relations of surgeon and sister those of principal and agent or of master and servant, or neither? The legal theory, broadly, is that if A has only the right to direct what work B is to do, the relation is that of principal and agent; if A has the further right to direct how B shall do the work, the relation is that of master and servant. B may be the servant of A though C pays the wages and has the power to dismiss; and B may be simultaneously the servant of A and C for different purposes. The Lord Chief Justice seems to have advised the jury that the theatre sister is not a servant but "one of a team." The legal implications of this status remain obscure. The relationship is presumably a question of fact for the jury; if so, the decision may differ with the facts of each case.

The public will have noted Lord HEWART'S remark that, if a forceps is left inside a patient, somebody must be liable. Intolerant of subtle divisions of

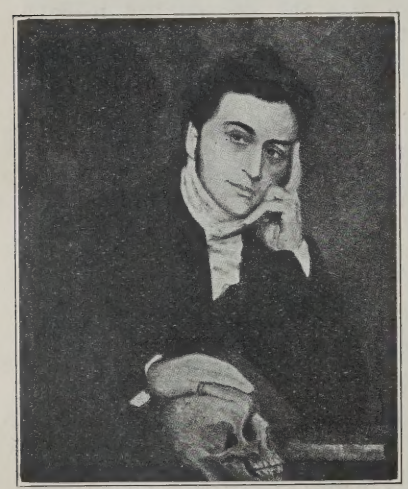
responsibility, the public may—if these unusual incidents recur—ask the profession to undertake some means of compensating the patient, though the evidence in Crotch *v.* Miles suggests that the scheme might have to be international in scope. Already the Law Society is considering some collective plan to reimburse those who lose by a solicitor's defalcations. And Parliament is busy with proposals for the universal insurance of motorists so that no injured person shall go uncompensated. The risk of loss, of course, is run by the surgeon as well as by his patients. He may incur huge expense in defending himself against claims for alleged negligence. Here, fortunately, a system of insurance exists; the surgeon can cover his risk by joining one of the professional defence societies. Mr. MILES'S defence was undertaken by the Medical Defence Union through their solicitors, Messrs. HEMPSONS; his subscription to the Union has proved a sound investment.

Annotations.

"Ne quid nimis."

THE HICKMAN MEMORIAL.

IT is impossible to estimate what mysterious moods will sway collective thought. We describe such a man as Galileo as born before his time, but it would be truer to say that his attempt to convince his fellows came during a refractory phase of the public temper. The times were not too early for his thought; they were simply "out of joint." It is a matter for speculation how many discoveries of value have been lost, swept away by a flood of untimely ridicule. Such was the fate of Henry Hill Hickman's work on anæsthesia at the beginning of the last century; and yet, less than 20 years later, the rediscovery of his principle was to engage the interest and support of the whole scientific world. His work was remarkable for patient, careful experimentation; his belief that anæsthesia, or, in his phrase, suspended animation, could be used to spare patients the pangs of surgical operation led him to inquire into the action of carbon dioxide on mice and dogs. In his notes he records experiments on a puppy a month old, which he placed on a piece of wood surrounded by water and enclosed in a glass cover; in ten minutes the puppy showed signs of uneasiness, and at the end of 17 minutes respiration ceased. Hickman was then able to remove one of the ears before returning respiration restored consciousness. Experiments made in a similar way, and others performed with carbonic acid gas, obtained from the action of sulphuric acid on lime, gave such good results that he attempted to bring his discovery before the Royal Society, 1824, and in the same year he published his pamphlet on "Suspended Animation." No reference to his work has been found in the Royal Society's records, but apparently it was severely criticised in the reviews, and condemned as wild and impractical. In 1828 his faith in his principle led him to present a memorial of his work to Charles X. of France with an appeal to be allowed to develop his theories in the French medical schools. A commission was certainly formed to inquire into his discovery, but no report of their opinion has yet been found, and the interest excited was clearly not great. Hickman returned disappointed to England and died at the beginning of 1830.



HENRY HILL HICKMAN, M.R.C.S.
(From an oil painting in the Wellcome Historical Medical Museum.)

His character, as indicated by his writings, was humane and kindly; in his pamphlet of 1824 he says: "if one grain of knowledge can be added to the general fund, to obtain a means for the relief of pain, the labours of the author will be amply rewarded"; and in writing of his experiments, he says they "were necessarily made upon living animals, but they were confined to animals previously condemned to death; and as their lives were preserved, and their suffering very slight . . . I venture to hope that they, in the aggregate, rather received benefit than injury." To his faith in his work he testifies in the last sentence of the pamphlet: "I feel so confident that animation in the human subject could be safely suspended by proper means, carefully employed, that (although I could not conscientiously recommend a patient to risk his life in the experiment) I certainly should not hesitate a moment to become the subject of it, if I were under the necessity of any long or severe operation." Yet in 1847 claims to the discovery of surgical anæsthesia were made by Morton, Wells, and Jackson in America, and in spite of the efforts of Dr. Thomas Dudley to direct attention to the earlier work of Hickman, the credit was apportioned unfairly. At the Wellcome Historical Medical Museum the documents relevant to Hickman's work are now exhibited. On the occasion of the centenary of his death on Wednesday Lord Dawson of Penn delivered an address at the Museum (see p. 776), when an admirably illustrated souvenir was offered to the guests. The Section of Anæsthetics of the Royal Society of Medicine are to place a memorial tablet on his tomb in Bromfield Churchyard to-day (Saturday) on the 100th anniversary of his burial. It is an easy matter to condemn our predecessors for lack of perception, but it engenders an uneasiness lest we are consigning our own prophets to the doubtful consolation of posthumous laurels.

PROF. W. H. WELCH AT EIGHTY.

THE eightieth birthday of William Henry Welch is to be celebrated on April 8th at several centres in Europe as well as in America. In London all who are interested are invited to attend at the London School of Hygiene and Tropical Medicine, at Keppel-street, W.C., at 4 P.M., when the Director, Sir Andrew Balfour, will give an address, with lantern illustrations, on Dr. Welch's life and work. The largest birthday gathering will be at Washington, when a meeting to be held in Continental Hall will be addressed by President Hoover, whose speech will be broadcast by radio across the continent, and relayed from the London Regional Station at 5 P.M. The chairman of the committee in charge of the arrangements is Dr. Simon Flexner, and the opening address is to be given by Dr. Livingston Farrand, president of Cornell University. A special feature of the occasion will be the presentation to Dr. Welch of the first print from a dry-point etching portrait of him made by Alfred Hutty.

William Henry Welch was born in Norfolk, Connecticut. His father was a practising doctor, as were also four uncles, a grandfather, and a great-grandfather. He entered Yale University at the age of 16, and four years later graduated B.A. After a

year spent in teaching Greek and Latin he matriculated in the College of Physicians and Surgeons of New York, but quickly realised the need for a better scientific foundation, and went back to Yale to study chemistry. Returning to New York in 1872 he won the award of a microscope, then a comparatively rare instrument, and with it began his notable career in the new science of pathology. In the early summer of 1876 he reached Strasbourg and studied histology and physiological chemistry under Waldeyer, Hoppe-Seyler, Baumann, and von Recklinghausen. Later he went to Leipzig, where he worked under Wagner and Ludwig. The next year found him at Breslau working under Cohnheim, who was then engaged on his text-book of general pathology, and already Welch's own contributions to bacteriology were considered worthy of being incorporated in the book. On his return to America he spent six years in the laboratories at Bellevue College, and in 1884 accepted the post of pathologist at Johns Hopkins Hospital. Before beginning his work at Baltimore in the autumn of 1885 he returned to Europe for further post-graduate study under Pettenkofer, Flügge, and Koch. He became the principal adviser in the early development of the Johns Hopkins Hospital, and in the selection of the other three original members of the staff, Osler, Halsted, and Kelly. When the medical school was opened in 1893 Welch was its first dean. His career from that time on in medicine and public health is well known. His resignation of his post as director of the school of hygiene four years ago was merely the opportunity for new efforts and the founding of a new institution. As professor of the history of medicine he set to work with characteristic energy to make a marked success of the new medical library at Johns Hopkins which was dedicated six months ago and named after him. He is still one of the most active figures in American medicine, and we trust he will long continue his public work.

A NEW ANTISEPTIC FOR INTERNAL USE.

THE announcement of the discovery of a new antiseptic for internal use always arouses considerable interest. The essential properties of low toxicity combined with high germicidal powers are so difficult to find in any one substance that the use of internal antiseptics is now on the decline. At the present time they probably find their greatest application in the treatment of infections of the urinary tract; but here again it is difficult to find any substance sufficiently non-toxic and non-irritating to the gastro-intestinal tract to ensure excretion in the urine in sufficient strength to destroy the invading organism. Of recent years attention has been directed towards the members of the homologous phenols. The first substance to find extensive employment was hexylresorcinol, an antiseptic introduced into medicine through the work of Johnson and Lane in 1921,[1] and Dohme, Cox, and Miller in 1926.[2] By studying the influence of alkyl substituents upon the germicidal value of resorcinol, they showed that it rose to a maximum at 4-*n*-hexylresorcinol, and also that the antiseptic powers of the *n*-alkylresorcinols were greater than those of branched-chain alkylresorcinols having the same number of carbon atoms. Coulthard, Marshall, and Pyman[3] thought that an investigation into the effect of alkyl substituents upon the antiseptic value of phenol and its homologues might yield valuable results, as information upon this subject was very scanty. They used the Rideal-Walker technique for the determination of the phenol coefficients, but solutions in dilute aqueous sodium hydroxide were employed, care being taken to keep the concentration of sodium hydroxide below lethal strength. All the alkyl derivatives were prepared by reduction of the corresponding ketones by Clemmensen's method. It was found that the phenol coefficients of the *n*-alkylcresols were generally higher than those of the corresponding *p*-*n*-alkylphenols, and very considerably higher than those of the *n*-alkylguaiacols, and, further, that the antiseptic powers of the compounds generally increased with the number of carbon atoms in the side chain up to the *n*-amyl derivative and then diminished. 4-*n*-amyl-*m*-cresol was studied in some detail, and proved to have phenol coefficients of from 200–300 not only when tested against *B. typhosus* but also against streptococci and staphylococci. Moreover, as compared with other substances, it has a low toxicity, and so would appear to be an important discovery from the point of view of medicine. Dr. Pyman, in an article in the current number of the *Journal of the Society of Chemical Industry*, points out also that it possesses a pleasant taste, which would make it very suitable for use in mouth-washes and similar preparations. In order to test its bactericidal action, varying solutions were added to 5 c.cm. of a mouth-washing, shaken up, and the number of colonies at the end of 5 and 15 minutes counted. A striking reduction was observed with solutions of 1 : 10,000 and 1 : 20,000. It will be interesting to observe experiments on its value as a urinary antiseptic.

[1] Johnson and Lane: Jour. Amer. Chem. Soc., 1921, xliii., 348.
[2] Dohme, Cox, and Miller: Ibid., 1926, xlviii., 1688.
[3] Coulthard, Marshall, and Pyman: Jour. Chem. Soc., February, 1930, p. 280.

HEALTH OF THE NAVY.

THE Statistical Report of the Health of the Navy for 1928[1] having now appeared (speeded up some three months on its predecessor) it is possible to compare the sickness and mortality-rates in the three Services for the year 1928.

Rates per thousand.	Cases.	Deaths—	
		Total.	From disease.
Navy	446	2·22	1·34
Army	426	2·5	1·63
Air Force	430	4·49	1·31

Both case rates and invaliding rates are diminishing in the Navy, and the death-rate from disease is the lowest yet recorded. The death-rate from violence is apparently only a quarter of that among British seamen in the mercantile marine during the same year. The number of men in the Navy in 1928 was 90,820, a decrease of about 2400. The chief causes of invaliding were as follows: 214 for diseases of eye; 119 for pulmonary tubercle (22 for non-pulmonary); 111 for diseases of the ear; 74 for wounds and injuries. Deaths were due in 50 cases to injury, in 17 to pulmonary tubercle (3 non-pulmonary), in 15 to pneumonia, in 15 to disease of intestines; 14 deaths were suicidal, 11 men were drowned. Vaccination against small-pox is now repeated every five years, with a single insertion which will involve less loss of service. Though vaccinations and revaccinations increased from 12,000 in 1927 to 19,000 in 1928, the resulting loss of service was reduced by a half. Three cases of small-pox were seen in China, of which one died. Diphtheria has, it is hoped, been banished from Greenwich Hospital School by Schick testing and immunisation; toxin-antitoxin floccules is regarded as the production of stimulating antitoxic immunity better than toxoid, and without causing reactions. A case of cutaneous diphtherial ulcer was recognised in hospital and cured with antitoxin, but no carriers were found in the ward. Of typhoid fever there were three cases with one death, of paratyphoid four cases. The cases of influenza numbered one-fifth only of those in 1927; they occurred chiefly at home. Malaria increased slightly, most of the cases coming from West Africa; in spite of prophylactic quinine, supervised mosquito nets, and other precautions, there were 41 cases on a sloop. A stoker who died of heat stroke in the East Indies showed post-mortem

[1] H.M. Stationery Office. 1930. Pp. 151. 5*s*.

subtertian parasites in the spleen. Cases of pneumonia were fewer, total 1·94 per 1000; at home, 2·63; abroad, 1·5. Rheumatic fever, with a case rate of 1·14, occurred about equally abroad and at home. Pulmonary tuberculosis shows much the same figure as last year, but invaliding is less. The chief incidence was on seamen, with 77 cases (2·05), the most dangerous age being between 20 and 25, but with increasing liability after five years' service. All three Services have reported specially on tubercle this year, and all find pleurisy to be a frequent precursor; seven years ago, in 1921, there was no special report on tubercle from any one of them,[2] and in all the prevalence of tubercle has since been much reduced—in the Army from 2·0 to 1·4; in the Navy from 2·38 to 1·99; in the Air Force from 1·7 to 1·1. Two of 20 cases in the Air Force at home, and 11 of 153 cases in the Navy, had a family history of tubercle. For venereal disease the figures are much the same as last year; all varieties are more frequent abroad than at home—chancroid three times, gonorrhœa twice, and syphilis slightly. The lowest case ratio is claimed for the Atlantic fleet (41·22), but that for marines at head quarters is lower (25·12). Invaliding for syphilis is stated at nine, but eight further cases of locomotor ataxia are mentioned among the nervous diseases. Of encephalitis lethargica, 16 cases are mentioned, 11 were invalided, and one died. Two cases of plague in natives ended fatally at Bombay, infected in a rat-infested boarding-house. Of disseminated sclerosis seven cases occurred. Teeth conserved were 61,664, or 676 per 1000 men; in a group of about a thousand mouths examined specially, 36·23 were dentally fit, 59·08 required treatment (3·44 urgently), 4·65 required dental work. Scabies cases average six days under treatment. Poisoning and suicide have increased from 62 and 7 to 101 and 14 cases. Injuries and heat stroke are much reduced. The leeway of war time is being overtaken, this report (as already noted) following its predecessor in three months less than a year; but there is still no sanitary report on the cadets at Dartmouth.

THE COMPLEMENT-FIXATION TEST IN GONORRHŒA.

SEROLOGICAL reactions for the diagnosis of gonococcal infections have received rather scant attention in this country. In the October number of the *British Journal of Venereal Diseases* Dr. T. E. Osmond and Dr. J. O. Oliver have reviewed the results of testing over 5000 sera from unselected patients, some of whom suffered from gonorrhœa or syphilis or both diseases, others giving no history or evidence of venereal disease. A full description of the technique adopted is given, and the importance of the antigen used in this test is stressed. The method of preparation used is that of D. Thomson, in which suspensions of the organisms are dissolved in alkali and afterwards neutralised to an exact pH of 7·0. Many separate antigens are prepared and each is tested; those giving satisfactory results with the preliminary testing are pooled. The importance of using multiple strain antigens is very great, and, as a rule, not less than 12 selected ones should be taken for the preparation of the mixed product. This pooled antigen must be examined in parallel with a mixed antigen of known value in a considerable number of cases, or tried out against many sera from cases studied clinically when no previous antigen is available as a standard. From a classification of results into groups the remarkable specificity of the test becomes apparent, since the percentage of falsely positive results obtained is as low as 0·6 per cent. In all cases beyond the earliest stage a high proportion of positive results was obtained ranging from 50 to 95 per cent. in cases of definite gonococcal infection with complications. Up to the tenth day of the disease a positive result is not to be expected unless complications have already occurred; the incidence of positive results during this period is higher in males (13·9 per cent.) than in females (4·3 per cent.). An early positive reaction almost invariably indicates extension of the disease to the posterior urethra in the male or to the cervix uteri in the female. From the tenth to the twenty-first day of the disease is the commonest time for the appearance of the positive reaction, males giving 50·1 per cent. and females 54·3 per cent. These figures rise to 70·5 per cent. for males and 56·4 per cent. for females, when infection has lasted up to a year. Owing to the specificity of the test a positive result in any stage of the disease is practically diagnostic, whilst a negative reaction resembles a negative Wassermann reaction in that it may occur at any stage. Its diagnostic value is limited except in the differential diagnosis of complications such as arthritis or epididymitis, for in these a positive result is found in 95 per cent. of cases. Considerable difficulty exists with regard to the disappearance of a positive reaction with cure. Dr. Osmond and Dr. Oliver differ from certain other observers in that they do not regard the persistence of a positive reaction as proof of failure of cure. They regard the gradual falling off in the positive reaction as a normal event in many cases which subsequent history suggests were in reality cured. Cases are quoted which show that the disappearance of a positive reaction may be a slow process. Stock vaccines are thought to influence the reaction much less than autogenous ones. A negative reaction in a patient who has once shown a positive one is of great value as a criterion of cure.

NARCOTICS IN ASIA.

THE Society of Friends has for many years taken a deep interest in what is known as "the opium problem," and several of its members took an active part in the movement which led up to the abandonment of the Indo-Chinese opium trade. Among these was the late Mr. J. G. Alexander, the father of the author of a brochure recently published.[1] With the assistance of a travelling scholarship awarded to him by the Selly Oak Colleges, Mr. H. G. Alexander visited India, Rangoon, Malaya, and Java during 1927–28 with a view to making independent investigations of the present position of the opium question in those countries. As a result of this tour he is less severely critical of the opium policy of the Indian Government than are some of the more zealous writers on the subject. While rejecting the plea of the Royal Commission of 1895 that opium is a prophylactic against malaria, he considers the pernicious effects of opium-smoking and opium-eating as less disastrous, socially and morally, than the wholesale abuse of morphine, cocaine, and heroin, with which western countries have flooded Egypt, India, China, and the Far East. Mr. Alexander, nevertheless, condemns what he regards as the contradictory policy of the Indian Government in urging decreased consumption on the one hand, while "its agents are trying to push sales in order to increase revenue" on the other. In some parts of India, notably the United Provinces, Mr. Alexander was informed that cocaine addiction was "spreading like wild-fire"; huge figures indicating the extent of the illicit traffic and police seizures have been published, and according to the United Provinces Excise Report most of this contraband cocaine comes from Germany, Italy, and Japan. The allegation that India is being swamped with opium smuggled from China is here disputed; careful inquiries were made by Mr. Alexander and the conclusion was reached that illicit traffic proceeds from Persia and Rajputana. The cessation of the Indo-Chinese trade in 1907 left large stocks of opium in the hands of the merchants in the Malwa States which are outside Government control.

[2] Tuberculosis in the Services. See THE LANCET 1924, ii., 664.

[1] Narcotics in India and South Asia. By H. G. Alexander, M.A. London: Williams and Norgate, Ltd. 1930. Pp. 64. 2*s*. 6*d*.

It is contended that from this source opium is being smuggled to many parts of the world, including South Africa, Australia, and other distant countries, as well as to British India. The author states that while in nearly all great cities of India opium addiction is common, in some it is serious, and that in the upper part of the Assam valley opium consumption is heavier than in any other part of British India. Parts of Orissa, of Beran, and of the Punjab are also black spots in this respect. The remedy suggested is registration and rationing, and in the cities the transfer of sale of opium to druggists, who should sell it only under medical prescription. In conclusion Mr. Alexander, while not minimising the evils of opium-eating and opium-smoking, insists that the "main guilt" lies with Western nations, who are making large profits by the excessive manufacture of morphine, heroin, and cocaine, and exporting these alkaloids by the ton, and by clandestine methods to the detriment of the native populations of Asia. His views are conceived in a more dispassionate spirit than are many of the disquisitions of lay writers on the opium problem and deserve attention. The message of this book confirms the conclusion which the Advisory Committee on opium at Geneva appears at last to be formulating, that, as The Hague Convention of 1912 implied, control of narcotic drugs *at the source* is the only way to restrict their use to legitimate medical purposes.

THE SLUM CLEARANCE BILL.

THE text of the Government's new Housing Bill was issued on Tuesday last, and Mr. Greenwood, the Minister of Health, will move the second reading next week. The measure, in addition to dealing with slum clearance and improvement, also contains provisions in regard to rural housing and small houses for aged persons. There are 56 clauses and five schedules, and the Bill is accompanied by a financial memorandum. The Bill is drafted with a view to enabling local authorities to direct their attention first of all to areas where conditions are so bad that the only remedy is clearance; secondly, to improvement areas, semi-slum areas which are degenerating into slums, partly because of overcrowding, and partly because of unsatisfactory buildings; and thirdly, to individual houses which are in need of repair, or are so bad that they must be demolished.

The first part of the measure deals with clearance areas and improvement areas, and the second part with individual insanitary houses. The definition of a clearance area is substantially the same as that of an unhealthy area under the existing law. The area can be cleared either by requiring the owners to demolish the buildings, or by the local authority purchasing the area and arranging for the demolition. The first method is new and is intended to enable local authorities to remove bad slums without being obliged to incur the heavy capital expense of purchase and clearance. The local authority will make a clearance order which must be confirmed by the Minister of Health—after a local public inquiry if objections are raised. When an order has been made it will be the owners' duty to demolish the buildings. If they fail to do so the local authority will be empowered to demolish and to recover the cost. The cleared site will remain with the owners who may, subject to local by-laws, dispose of it or redevelop it at their discretion. The second method of dealing with a clearance area will be by purchase by the local authority which would itself undertake the removal of buildings on the site. The procedure is intended to be more simple and expeditious than that at present in operation, and does away with the necessity for a formal scheme. The local authority having bought the land by agreement or by compulsion must proceed to demolish the buildings, and either appropriate the land for some purpose for which they have statutory powers, or otherwise dispose of it. In some cases they may have to rehouse on the site, or they may maintain it as an open space. Clauses 5 and 6 deal with improvement areas—those districts where the general conditions are not so bad as to justify wholesale clearance, and where a great improvement can be secured if the worst houses are removed, necessary repairs are executed, surplus population removed from the area, and steps taken to ensure that once the area has been improved it is not allowed to relapse. An essential part of any action taken by local authorities in regard to either clearance or improvement areas must be the provision of new houses, and the Bill requires that before taking any steps involving the displacement of population the local authority must undertake to provide new dwellings to the satisfaction of the Minister. Clause 5 enables local authorities to define improvement areas, and Clause 6 sets out the action which must be taken, when an area has been defined, to compel the demolition of houses which are beyond repair, and to put other houses into a satisfactory condition. It is not proposed to make any change in the present law of compensation for property in a clearance area. Property compulsorily acquired in such an area will be purchased site value with a reduction where the proposals involve the use of the cleared area for rehousing purposes or for an open space. Local authorities will, however, be enabled to make reasonable allowances to displaced persons for removal expenses and to compensate any loss which, in the opinion of the local authority, may be sustained by such persons owing to disturbance to their trade or business.

The second part of the measure proposes to alter the present law with regard to the repair and demolition of individual insanitary houses. The object will be to simplify the procedure, and it is provided that the appeal tribunal shall be the county court instead of the Minister. Houses which are considered unfit for human habitation may be divided into those which can be made fit at a reasonable expense and those which cannot. In the case of houses in the first class local authorities may require the owner to carry out the necessary work or, if the owners fail to do so, the authority may do it themselves and recover the cost. In suitable cases money may be lent to owners undertaking repairs. If the house cannot be made fit at a reasonable cost, the local authority may enforce an order for its demolition. The third part of the measure provides that the council of every borough and urban district (and in London the City Corporation and County Council) with a population of more than 20,000 shall submit a programme of housing work to the Minister in 1930 and every fifth year thereafter.

A new principle underlies the financial provisions of the Bill by which the present 50 per cent. grant is to be abolished and replaced by an annual grant on a unit basis, which the associations representing the local authorities are willing to accept. The new grant is to help towards the expenses incurred by local authorities in rehousing persons displaced from clearance areas; improvement areas and also individual insanitary houses outside those areas which are demolished by order of the local authority. The grant will be based on the number of persons required to be displaced for whom accommodation in new houses provided by the local authority is made available, and will be payable annually for 40 years. The normal grant will be 45*s*. a year per person required to be displaced, and this will be increased to 50*s*. in the case of persons displaced from houses in agricultural parishes. Where it is necessary to rehouse on expensive sites in tenement buildings of more than three storeys, or where the approved cost of the site exceeds £4000 an acre, the grant will be increased to 70*s*. per person. The object of this is to meet the special cases where people must be rehoused as near as possible to their work. Certain special conditions must be observed in regard to houses made available for displaced persons. Rents must be fixed by the local authority after taking into

account a charge on the rates of not less than the equivalent of £3 15*s.* a year for 40 years, the normal charge borne by the rates for houses provided under the Wheatley Housing Act. The Government believe that the increased assistance proposed will enable the authorities to provide a proportion of houses at "Wheatley" rents, and others at a definitely lower rental. Assistance is to be granted through local authorities to societies and companies engaged in housing who limit the amount of their dividends or who do not trade for profit, and who are willing to help in the work of rehousing persons displaced from slum areas. In Clause 39 there is a proposal to build houses for aged persons of a smaller size than the minimum in respect of which Exchequer assistance can now be given. The present Exchequer contribution is £7 10*s.* a year for 40 years. In respect of the new smaller houses it will be £5 a year for 40 years, equivalent to a capital value of £86.

A further attempt is to be made to deal with rural housing, and it is proposed to place a new responsibility on county councils by giving them power to undertake building on behalf of a rural district; by enabling them to contribute to the expenses of ordinary rural housing, and by putting an obligation on them to contribute to houses provided by rural councils for agricultural workers, or persons of similar economic status. It is proposed that the unit grant shall be reviewed every three years and at the same time the period at which the Wheatley grants are reviewed will be increased from two to three years. The Bill does not apply to Scotland, which is to be dealt with in a separate measure.

IN THE INTEREST OF MIDWIVES.

IMPROVEMENT of the midwifery service of the country requires united action on the part of all those interested in order that urgent problems may be dealt with promptly as they arise. This aim has led to the formation, at the instance of the Council of the Midwives Institute, of a joint committee representing the following bodies: Association of Inspectors of Midwives; Association for Promoting the Training and Supply of Midwives; the College of Nursing; the Incorporated Midwives Institute and the Queen's Institute of District Nursing. The objects of this joint committee, on which six additional members have been coöpted, are: (1) To support all schemes which in the opinion of this committee will genuinely promote the welfare of mothers and midwives; (2) to oppose any legislation involving transference of the control of the profession of midwifery from an independent body to a Government department; (3) to formulate proposals for the reorganisation of the special body which should have control over midwives and their training; and (4) to endeavour to arouse public opinion in support of the above objects. The committee has already received wide support for its policy on object (2). The committee is in entire agreement with the report of the departmental committee in so far as it relates to a comprehensive and national maternity scheme, provided that the legislation introduced is in accordance with the proposals outlined which are briefly as follows:—

(*a*) Medical examinations during antenatal period.

(*b*) The mother to retain a cash maternity benefit and in addition to be given the full services of a certified midwife or, alternatively, a doctor and a midwife acting as a maternity nurse.

(*c*) The services of a doctor when required.

(*d*) The services of a specialist on the doctor's request.

(*e*) Institutional provision for the confinement of abnormal cases, patients with unsuitable home conditions, and also for those who desire such arrangements.

(*f*) Further medical examination six weeks after the confinement.

(*g*) The midwife to be responsible for antenatal and postnatal care and nursing to cover a period of 14 days with increased number of visits.

On the other hand, the committee is not in favour of the proposed limitation of the midwife's cases to about 100 in the year, preferring the general acceptation that no midwife should undertake a larger number of cases than she can adequately deal with, in view of the additional work to be put upon her. The committee would make obligatory the following permissive provisions under the Maternity and Child Welfare Act—namely, subsidies to midwives in rural areas, the provision of sterilised maternity outfits to mothers free or at cost price, the payment of part or the whole of the fee to the midwife when the patient is necessitous, and the provision of post-certificate training for midwives. Local authorities should be empowered to give compensation for the midwife if a case for which she was engaged is sent to an institution, to provide for her in old age and sickness, and to assist in transport and telephone service in rural areas. The committee is of opinion that the Central Midwives Board or any new special body having control over midwives should retain the whole duties connected with the training, penal work, and the examinations and government of the profession. Such a body should, it is felt, consist as in the past of representatives from the Government, the midwives, the medical profession, and local authorities. Finally, the committee expresses the hope that the inspection of new training centres which apply for permission to train pupil midwives will be extended to all training schools, teachers, and systems of teaching.

Lady Houston has given £100,000 to St. Thomas's Hospital, London. The gift has been made without conditions, and will be paid into the general fund of the hospital.

WE regret to learn the death, which occurred on Sunday last in a nursing home, of Dr. John Yule Mackay, the well-known anatomist and Principal of University College, Dundee. For many years Prof. Mackay's share in the deliberations of the General Medical Council was recognised as authoritative on all educational questions.

THE first international Congress of Microbiology will be held in Paris from July 20th to 25th. Arrangements for attendance are being made by the British Committee of the International Society for Microbiology, and any who desire to take part in the Congress should apply to Messrs. Thos. Cook and Son, Berkeley-street, London, W.1, or to any of their branches.

THE first Congress of the International Society of Orthopædic Surgery, under the presidency of Sir Robert Jones, will be held in Paris from Oct. 2nd to 4th next. The vice-presidents of this Society are Prof. V. Putti, of Bologna, and Dr. Gocht, of Berlin, the secretary-general is Dr. Delchef, and the treasurer Prof. Maffei, both of Brussels. Subjects chosen for discussion at this congress are: (1) Treatment of congenital dislocation of the hip after the age of 15 years. On this subject America, Germany, Great Britain, and Italy have been asked to supply speakers. (2) Treatment of injuries in the region of the wrist-joint, which will be discussed by representatives of France, Holland, and Sweden. The Secretary of the Congress is Dr. Albert Mouchet, rue de Courcelles 124, Paris.

ROYAL FREE HOSPITAL.—The annual Court of Governors was attended last week by the American Ambassador and Mrs. Dawes, who visited the Eastman Dental Clinic, the gift of Mr. George Eastman, of Rochester, New York. The new obstetric department has been begun, and it was reported that the 365 beds are always full. The 1928 deficit of £16,595 has been reduced to £7538.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lts. to be Surg. Lt.-Comdrs.: J. G. Holmes, R. G. Anthony, and E. R. Sorley.

The following appointments are notified: Surg. Lts. C. J. Farr to *Verbena*; N. A. Dickinson to *Pembroke*, for R.M. Infirmary, Chatham; and R. B. McVicker to *Veronica*.

ROYAL ARMY MEDICAL CORPS.

Maj. W. J. E. Bell, from the secd. list, is restd. to the estabt.

Maj. A. F. I. Patterson retires, receiving a gratuity, and is re-empld. under Art. 507 (*b*), Royal Warrant for Pay and Promotion.

Lt. W. H. Scriven is secd. for serv. with the Sudan Def. Force.

TERRITORIAL ARMY.

Capts. P. Lloyd-Williams, W. R. Watt, and J. T. Kyle to be Majs.

Capt. R. W. Gemmell (late R.A.M.C.) to be Capt.

Lt. R. E. Holme to be Capt.

Lt. R. V. Facey (late R.A.F.) to be Lt.

W. W. Crawford to be Lt.

Supernumerary for Service with O.T.C.: J. P. Raban (late Offr. Cadet, Lond. Univ. Contgt., Sen. Div., O.T.C.) and H. H. Kenshole (late Offr. Cadet, Univ. of Lond. Contgt., Sen. Div., O.T.C.) to be Lts., supern. for serv. with Med. Unit, Univ. of Lond. Contgt., Sen. Div., O.T.C.

ROYAL AIR FORCE.

Flight Lt. E. J. T. McWeeney is transferred to the Reserve, Class Di.

INDIAN MEDICAL SERVICE.

Capt. A. K. Sahibzada to be Maj.

The probationary appts. of the undermentioned officers are confirmed. The order of seniority is as now notified:—To be Capts.: F. R. W. K. Allen. To be Lts.: A. V. O'Brien, S. T. Davies, E. S. S. Lucas, H. W. Farrell, J. S. McMillan, V. E. M. Lee, M. R. Sinclair, G. B. W. Fisher, R. A. Paton, G. F. Condon, H. S. Smithwick, and D. Tennant.

DEATHS IN THE SERVICES.

Fleet-Surg. Alfred Thomas Corrie, R.N. (retd.), who died at Plymouth on March 28th, entered the Navy as surgeon in 1872. He served in the corvette *Pearl*, and was present at Santa Cruz, South Pacific, when an attack was made on shore by natives. This resulted in the death of the Commodore and two men, and Corrie was placed in medical charge of the boats sent to punish the outrage. For some time he was surgeon at the Plymouth Naval Hospital, to the Royal Marine Artillery Infirmary at Eastney, and to the R.N. Hospital, Ascension. He was promoted to staff surgeon in 1884, fleet-surgeon in 1892, and retired in 1902.

ROYAL MEDICAL BENEVOLENT FUND.—During the first quarter of this year £2562 has been voted in grants to 121 applicants. At the last meeting of the committee 42 grants were voted, amounting to £866. The following were some of the cases helped:—

M.R.C.S., aged 76. Married, wife aged 66. Applicant suffers from advanced chronic glaucoma. He has lost the sight of his right eye. Although maintaining some sight in his left eye he is becoming more helpless and dependent on others. Applicant and his wife have no private income; he is in receipt of Old Age Pension £26 a year. Four married children contribute £96 towards the maintenance of their parents. Fund voted £40.

M.R.C.S., aged 59. Applicant is bedridden and is suffering from progressive paralysis in the legs. He was compelled to give up his practice in 1925. His savings had been invested in house property. The fall in values and the annual outlay in repairs has reduced the income derived therefrom to £130. Being bedridden he has to pay for nursing and attendance in addition to board and lodging. Fund voted £20.

Widow, aged 38, of M.R.C.S. The husband had been ill for several years with Bright's disease. On his death the widow was left with £250 a year and eight children to educate. One has obtained a Scholarship. Freemasons are paying part school fees for another. Friends and relations are helping towards other school fees. Fund voted £25 and have asked the Royal Medical Benevolent Fund Guild to coöperate in this case.

Daughter, aged 61, of M.D. Has been a companion housekeeper from the date of her father's death till December, 1929, when her employer died. She has no private income, now staying with friends. Fund voted £26.

Subscriptions and donations are very urgently needed as the number of applications received during the first three months of this year is even larger than that of last year.

Cheques should be forwarded to the honorary treasurer, Royal Medical Benevolent Fund, 11, Chandos-street, Cavendish-square, London, W. 1.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCCI.—THE TREATMENT OF SYPHILIS.*

IN a short article it is possible to deal with only a small section of such a vast subject as the treatment of syphilis. I am here concerned mainly with generalisations and principles. I will speak first of the principles of treatment of early syphilis—i.e., of the so-called primary and secondary stages.

TREATMENT OF EARLY CASES.

Lessons from Experimental Syphilis.

Certain investigations in experimental syphilis seem to have a bearing on the problem in the human subject. The observations of W. H. Brown and L. Pearce on the course of syphilis in rabbits after experimental inoculation showed that it resembles the course of another spirochætal disease—relapsing fever—in its succession of phases of active disease alternating with phases of latency. In the rabbit the disease seems to become active in tissues according to a more or less regular order of sequence. Thus, in cases where manifestations become generalised, after the primary lesion, bones, followed by skin and then eyes, appear to become affected.

A further point of some importance is that the successive phases of activity are influenced in their locality and degree by the degree of severity of their predecessors. Thus Brown and Pearce found that if a rabbit has two primary sores it is much less likely to develop generalised lesions than if it has only one. Further, if the development of the primary lesion or lesions is interfered with, by excision of the area of inoculation or by administering antisyphilitic remedies in subcurative doses, the rabbit is much more likely to develop generalised lesions. Brown and Pearce found, in fact, that they could more or less determine the locality of metastatic lesions by interfering with the primary sore at given stages of its development. Thus by fairly early interference they would find the bones unprotected, and metastatic lesions would occur there. If subcurative treatment was withheld until a little later, the metastases would skip bones and occur in the next tissue in the natural order of sequence for lesions in the rabbit—viz., skin—or the skin might be skipped and the eyes become affected. Brown and Pearce's investigations showed, in fact, what has been demonstrated by numerous workers, that the syphilised animal develops a resistance to the spirochæte of syphilis which is proportional to the degree and duration of the interaction between spirochætes and tissues. As another example of the same effect is the fact that a syphilised rabbit can be super- or reinfected at an early stage of the infection, but if one waits for about three months before eradicating the disease it has now become immune to reinfection with, at any rate, the same strain of virus.

I suggest that this has a bearing on the treatment of human syphilis in this way. We know that the virus spreads through the body very rapidly. For example, changes in the cerebro-spinal fluid have been demonstrated even as early as the primary stage before the serum reactions have become negative, and we must suppose that at the time we commence the treatment of our early case there are nests of spirochætes in practically every tissue of the body. We have also good reason for believing that some foci are less accessible to our remedies than others and that amongst the less accessible are those in the central nervous system. If we were to allow the disease to take its natural course, we should expect in most

* The substance of this article formed the opening address in a discussion at the Medical Society of London on Feb. 24th.

cases a widespread eruption on the skin and mucous membranes. I suggest that the effect of this eruption would be to confer a strong degree of resistance on the tissues generally, including those of the central nervous system, and this idea is certainly favoured by the fact that in cases of late neurosyphilis such as tabes and general paresis one rarely finds a history of secondary symptoms.

So far the argument has favoured the idea that, if we interfere with the development of the disease in the skin and mucous membranes, we interfere with the development of a resistance to the activity of the parasite in other parts of the body which would tend to save him from severe late effects of the disease in such vital structures as central nervous system and cardiovascular system, and there are some who even say that if they had syphilis they would not commence treatment until the secondary stage was well over. I wonder if they would if it came to it. There are many reasons against such a procedure, the most important being the danger to other persons, the greater opportunity given to the spirochæte to become protected in foci of fibrosed tissue, and therefore inaccessible to later attack, and also the possibility that, after all, the skin reaction might not take place. When we weigh up the question of early interference by treatment versus allowing the disease to develop I do not think we can avoid deciding in favour of early interference. But we must keep in mind the risk we run of leaving the less accessible foci untouched by our remedies and unhampered in their development by the antibodies which would probably have formed if we had let the disease have full play with the skin. The moral seems to be that, if we interfere early, we must do so thoroughly and with the proper remedies.

Remedies Employed in the Treatment of Syphilis.

In considering the remedies and their place in the therapy of early syphilis, I would divide them into two main classes, antispirochætal and tissue stimulant. In the antispirochætal are mainly the preparations of arsenic, mercury, and bismuth, as well as a certain number of other metals such as vanadium, tellurium, and gold which have not come into general use. Amongst the tissue stimulant is pre-eminently iodine, and we should also include all preparations designed to raise the general resistance.

I would divide the antispirochætal preparations into two main classes, the arsenobenzols and the others because, generally speaking, the one is supplementary to the other. The *arsenobenzol preparations* are distinguished for the rapidity of their effect, but mainly also for its transience. The spirochæticidal effect of an arsenobenzol injection is dramatic so far as we can judge from examinations of the secretion from surface lesions, but it is over in at most 48 hours. If the dose is large enough it brings to an abrupt end the interaction between the spirochætes and the surface tissues. But does it kill off so easily those spirochætes which are buried in the central nervous system, and the cardiovascular system, and perhaps the viscera? The literature on early syphilitic neurorecurrences shows that in the overwhelming majority of cases they have occurred in cases treated only with arsenobenzol preparations. The patient has fallen between two stools, the development of a protective immunity has been stopped, and its substitute has been insufficient to destroy foci in the meninges. These nests of spirochætes have quickly recovered and have been unrestrained by any immune body. We have here, in fact, a close analogy to the case of the rabbits in which the development of initial lesions was hindered. We need something more than the arsenobenzol class of preparation for the eradication of syphilis, or shall we say for the protection of the patient against the activity of the spirochæte, and herein is a rôle for the antispirochætal remedies of the other class represented in working practice by mercury and bismuth.

Mercury has long been known as a remedy which acts slowly but more or less persistently. As judged by animal experiments, its spirochæticidal action is feeble in relation to its toxic, and, personally, I have always believed that in most cases treated by mercury the disease has just simmered on. The patient may have been protected against the development of granulomata, but has been rid of his infection. An advantage, however, of mercury, as also of bismuth, is that it can be given in such a way that it remains in the body constantly, restraining the action of the spirochætes, or perhaps restraining the tissues from kicking against them. Mercury has the advantage over bismuth that it can be given otherwise than by injection, as for example if one wishes to continue treatment by mouth, but when injection treatment is indicated I think that the preference will be given to bismuth because this is tolerated far better.

Bismuth.—According to the experiments of Levaditi and other workers, bismuth is much more actively spirochæticidal than mercury. Levaditi and a few others consider that bismuth is superior to the arsenobenzol preparations, but most workers rank it as a substitute for mercury. Certainly, by giving the more soluble preparations of bismuth, one can cause *S. pallida* to disappear quickly from the secretion of surface lesions, but there are disadvantages in the use of such preparations from the point of view of toxic effects, and unless there are contra-indications to the use of arsenobenzol, I prefer, like most workers, to give bismuth in such a form and in such a way as to ensure a steady absorption which on the one hand is not so rapid as to upset the mouth and kidneys, and on the other, not so slow that successive injections build up a large depôt at the sites of injection. Too large a depôt might become dangerous if the absorptive capacity of the tissues suddenly became greater as happened occasionally in the bismuth treatment of war wounds. The experiments of Levaditi and colleagues have shown that the antisyphilitic effect of bismuth is exercised when the tissues, apart from those at the sites of the injections, have taken up a certain minimal amount of the metal proportional to their weight. Later Lomholt found that a watery suspension of bismuth oxychloride was absorbed with satisfactory evenness. Engelhardt's analyses of urine from patients after administration of various preparations of bismuth showed inter alia that paraffin is worse than oil as a vehicle of suspension and that the absorption of the tartro-bismuthate of potassium and sodium (trepol) suspended in oil is very slow. This seems to be confirmed by Levaditi's finding that the administration of the maximum tolerated dose of trepol to a rabbit protects it against syphilitic infection for 152 days. Engelhardt's work generally showed that the most evenly absorbed of the preparations which he tested was a solution of bismuth naphthenate in oil which is sold as Embial. I have very little experience of this preparation—certainly not enough to enable me to compare it with others. Amongst other preparations which he investigated the subsalicylate in oil proved satisfactory.

My own experience is largely confined to bismuth in fine subdivision, the oxychloride suspended in glucose solution, the salicylate suspended in oil, and iodo-bismuthate of quinine. Generally I prefer a compound to the metal in fine subdivision, though I cannot support the preference by any analyses showing rates of absorption. An early case which was intolerant of "914" had received a number of injections of bismuth metal and should theoretically have been thoroughly under its influence. He developed paralysis of the sixth cranial nerve, and I began to doubt the absorption. It seems probable that, whatever preparation is used, it is reduced to the same state, a compound of the metal with albumin—i.e., Levaditi's bismoxyl—before it is taken into the circulation, so that one might imagine it better to feed bismuth to the tissues in the form of the metal itself just as is often done in giving mercurial injections. On the other hand, it seems probable that the metal may be more easily absorbed when in the nascent state newly removed from a compound, and I think there is support for this in the fact that the soluble compounds

of bismuth are far more rapidly absorbed than is the metal in fine subdivision. The iodo-bismuthate of quinine has the disadvantage of a low bismuth content, about 20 per cent., so that the individual injections have to be bulky to ensure the absorption of a sufficiency of bismuth, and I prefer the oxychloride or the salicylate. Of either the salicylate or the oxychloride I give 4 g. (totalling 2 to 3·2 g. bismuth metal) in a course of ten injections.

Concurrent versus Alternate Courses.

A question of considerable importance is whether one should give the bismuth at the same time as the arsenobenzol or give first a course of arsenobenzol injections and then one of bismuth. Firmly (I might say dogmatically) I am convinced that it is a mistake in an early case of syphilis to withhold the bismuth or the mercury until the end of the first course. Earlier in this article I pointed out that patients treated by arsenobenzol preparations alone tend more to suffer from syphilitic neuro-recurrences, and when I compare my experience in this matter with that of clinicians who give only arsenobenzol preparations at first, I am certain that the plan of giving the two remedies concurrently protects the central nervous system.

The next question is the amount of treatment which should be given to an early case of syphilis. In the analysis of cases treated at St. Thomas's Hospital, which was published some time ago by the Medical Research Council, I showed that some seemed to have been cured by an amount of treatment which nobody would agree was sufficient for the average case. On the other hand, even with sero-negative primary cases less than three full courses of "914" (5 to 6 g. in each) and bismuth or mercury, with intervals of two and three months between courses, left us with a percentage of relapses. With cases of sero-positive primary and of early secondary syphilis in the categories which had received even three courses there were 10 per cent. of relapses in my series, and I think that for cases which have reached the stage of positive serum reactions it will be necessary to prescribe more than three such courses as we give at St. Thomas's. I have tried the effect of spacing out the injections of "914" at much longer intervals than is customary at present, filling up the intervening weeks with injections of bismuth. The immediate results seem to have been as good as those of the course in which we gave ten injections of "914" in 13 weeks, but I am not yet able to speak as to permanence of effect.

I had hoped to prevent toxic effects of "914" by dissolving the remedy in 10 per cent. sodium thiosulphate, but, although dermatoses were reduced, the incidence of jaundice remained the same. We are now dissolving the "914" in 20 c.cm. of 40 per cent. of glucose, and I think that it has had a good effect in reducing the incidence of jaundice.

Summary.

To summarise my views on the treatment of early syphilis I would say that :

(*a*) The results of treatment before the serum reactions have become positive are far superior to those in later cases even though the secondary rashes have not appeared.

(*b*) The concurrent use of bismuth (or mercury) with "914" is likely to result in a minimum of relapse in the central nervous system—far less than when a course of "914" is followed by one of bismuth or mercury.

(*c*) However early the treatment is commenced three full courses should be given each totalling 5 to 6 g. "914" and 2 to 3 g. bismuth and lasting 10 to 13 weeks. If treatment commenced after the serum reactions had become positive, I would now prescribe more than three such courses.

TREATMENT OF LATER CASES.

Tertiary manifestations affecting the skin, mucous membranes, bones, muscles &c., require little mention because they usually yield to such treatment as is given to early cases. In late affections of the cardiovascular system I am a believer in the use of arsenobenzol preparations. Some workers consider these preparations are contra-indicated in syphilitic myocarditis, and I admit that one has to proceed carefully, but with doses of 0·2 to 0·3 g. sulpharsenobenzol given twice weekly, concurrently with bismuth injections, I have seen most beneficial effects. In tertiary disease of the liver I think arsenobenzol treatment is contra-indicated and prefer to rely on bismuth and iodides. In syphilis of the meninges after a cautious start lest a Herxheimer reaction should prove serious, I think one should push both arsenical and bismuth preparations to the limit of tolerance and I have seen only good from following this line. In *tabes* I prefer sulpharsenobenzol intramuscularly in conjunction with bismuth, or silver-salvarsan intravenously, and here also when practicable adopt the plan of giving injections twice weekly. Our results with tryparsamide have been rather mixed, but in both tabes and general paresis, like other workers, I have seen great benefit from malarial treatment.

I have said little about the use of iodides. Their rôle appears to be to stimulate the tissues to remove infiltrates, and for this purpose they seem to be indicated in early as well as in late stages. The work by Brown and Pearce already mentioned indicates also that iodides assist the defensive reactions and this is another reason for employing them. In later cases, and especially in tabes, I believe in pushing iodides to the limits of tolerance.

Lastly, I should like to emphasise the importance of measures designed to improve the patient's metabolism. We depend for spirochæticidal effect on derivatives of our remedies and patients differ greatly in the use they make of what we put into them as we can surmise from the fact that while some patients have been cured by single doses of "606," others have proved most intractable. We know too little about the processes which make for a good response to treatment, but one can well believe that the patient who is kept physiologically fit will afford us a better result than a sluggard or one we depress unduly by pursuing a rigid programme in spite of obvious signs of intolerance. Altogether, therefore, I would give plenty of treatment but only on condition that my patient is not unduly depressed by it. If he is, perhaps a holiday in good surroundings will do more for him than many injections.

L. W. HARRISON, F.R.C.P. Edin.,
Director, V.D. Department, St. Thomas's Hospital.

MEMORIAL TO A PHYSICIAN.—A tablet to the memory of the late Dr. J. T. Dunlop, who was honorary physician to the Newcastle Hospital for Diseases of the Skin, has been placed in the entrance hall of the building.

BIRMINGHAM HOSPITALS.—Birmingham General Hospital closed last year with a debit balance of £26,000 ; the Queen's Hospital had a deficit of £14,500. The dietetic clinic at the General Hospital "has gained in importance," and further developments have been made in the treatment of cancer by radium. The institution has been selected as a centre for radium treatment and research. Motor accidents are costing between £10,000 and £15,000 a year, and at the annual meeting it was finally decided so to alter the rules as to enable the victims of such accidents to be asked to pay for treatment. There were over 7000 in- and nearly 58,000 out-patients. The experiment of setting aside 30 beds for paying patients has proved an entire success from all points of view.—At the Queen's Hospital the average daily cost of in-patients (5004, an increase of 448) was 8*s.* 7*d.* and of each bed per year £156 14*s.* 3*d.* The report of the hospital work of the Birmingham Board of Guardians for the year ended on March 31st, 1929, shows that at the Dudley Road and Selly Oak Hospitals and the Lordswood Nursery, 22,958 in-patients were treated.—At the annual meeting of the Midland Nerve Hospital it was stated that the institution had reached saturation point as regards in-patients, and that "no other hospital out of London is treating nerve diseases as they are being treated" at that hospital. There were 53,000 out-patient attendances last year. An operating theatre and some isolation wards are to be added.

Special Articles.

A NOTE ON THE HEALTH OF THE CONSUMPTIVE WORKER UNDER SETTLEMENT CONDITIONS.

BY E. L. SANDILAND, M.B. LOND., D.P.H.,
MEDICAL SUPERINTENDENT, EAST LANCASHIRE TUBERCULOSIS COLONY.

IN view of the interest taken in this subject by many tuberculosis officers and other workers in tuberculosis some observations after six years' experience of a small settlement may be worthy of note. The East Lancashire Tuberculosis Colony and Sanatorium was established at Barrowmore Hall, near Chester, in 1921 for concurrent treatment and training of 70 cases. In 1924 the accommodation was extended to 112 beds, and sanatorium cases were admitted for treatment. In 1928 the accommodation was extended to 120 cases. Twelve cottages have been built for married settlers and a hostel for ten single settlers.

Sickness Among Settlers.

The first colonist was settled in 1922, and he is still in the settlement. Since that date 33 other men have been made settlers. Of these 34 settlers, three advanced cases have died and five have left the settlement, in the majority of cases to take up work elsewhere. There are now 26 settlers in all on the estate. The length of time these men have been settled and the periods of sickness up to Jan. 1st, 1930, are as given in Table I.

TABLE I.

Time colonised.	No. of men.	Total period of sickness for each group.
7 to 8 years	1	6 weeks.
5 „ 6 „	9	60 „
4 „ 5 „	2	3 „
3 „ 4 „	5	20 „
2 „ 3 „	4	15 „
1 „ 2 „	1	nil
Up to 1 year	4	nil
—	26 men.	104 weeks.

The total time of settlement of these 26 men amounts to 93 years and the total period of sickness from tuberculosis amounts to two years.

Types of Industry.

The industries carried on are these :—

(1) *Woodwork*—in which the majority of the men are employed. The heavy work is done by machinery to relieve the workers and increase the output. Some of the settlers, however, have a surprising capacity and desire for the heavier work. One case of artificial pneumothorax, which was at one time double, has given the medical staff some anxious moments on account of his zest for work.

(2) *Upholstery.*—One worker employed in this industry had a severe attack of pneumococcal lobar pneumonia and recovered; this attack apparently suspended the activity of the tubercle bacillus for some time. The dust inseparable from the teasing out of old stuffings is avoided by the use of a well-protected carding machine which has a fan and ducting to remove the dust outside the shop.

(3) *Boot Repairs.*—A finishing machine relieves the heavier work in this department.

(4) *Decorating.*—The work done by these men is almost entirely internal painting.

(5) *Poultry Farm.*—The work on a large poultry farm is at times rather heavy, especially as the work must continue over the week-ends.

(6) *Gardening.*—The settlers do no heavy digging. Other settlers are employed on clerical work, one as a porter and one as a lorry driver.

Extent of Disease.

Of these 26 men, 12 have had positive sputum and 14 have negative or no sputum at all. The anatomical extent of the disease compared with the time of sickness is shown in Table II.

TABLE II.

—	Diseased lung.				
	1 lo.	2 lo.	3 lo.	4 lo.	—
T.B. minus cases	2	8	2	2	14 men.
Total time of sickness in weeks	0	15	5	3	23 wks.
T.B. plus cases	0	0	6	6	12 men.
Total time of sickness in weeks	0	0	17	64	81 wks.

lo = lobes.

Working Hours and Absenteeism.

The total number of possible hours which these 26 men could have worked is 182,521 hours, and the total hours of work lost by these men through sickness due to tuberculosis was 4066. This represents 2·2 per cent., which would compare favourably with most communities. During the year January, 1929, to January, 1930, the carpentry department was employing 13 settlers. The total possible hours which these men could have worked during the year was 21,146. There were lost from sickness due to tuberculosis 1616 hours (7·2 per cent.), and of this number 1298 hours, or 80 per cent., were lost by one man, who is still under treatment.

Nine of the settlers have gained weight, the average gain being 7½ lb.; 17 of the 26 have lost weight, the average loss being 5½ lb.; 22 are working seven hours per day, and the remaining 4 eight hours per day. These men on eight hours per day are working under the same sheltered conditions as the men on less hours, and are not comparable with men working eight hours per day in the outside world. They are never pressed to work to their utmost capacity, not are they in competition with robust healthy workers. All the men are under constant medical supervision, and any failure in health is soon noted and treated, and, if necessary, the man's work is made easier for the time being; in this way long breakdowns have been avoided.

Should a man break down for a short period he is immediately admitted to the sanatorium and given the benefit of institutional routine and nursing, and his family is assisted, if necessary, from a fund provided for that purpose. This immediate institutional treatment, even for quite a short period, is of the utmost value in preventing serious relapses.

The goods for sale are being standardised as much as possible so that repetition work can be introduced. This is found advantageous from the point of view of the health of the worker, as well as for commercial reasons. Certain repetition work is suitable for unskilled sanatorium patients as part of their occupational therapy.

Discharged Settlers.

The industrial history of the five men who left the settlement is as follows :—

1. Married. Sputum-negative case; two lobes involved. Was a settler for two years as caretaker at hostel, where he worked seven hours per day. He had no breakdown.

2. Single. Sputum-negative case; two lobes involved. Was a settler four years. Worked in firelighter department seven hours per day for two years; afterwards drove Ford van for two years. He had no breakdown.

3. Single. Sputum-negative case; two lobes involved. Was a settler for three years. Worked seven hours per day in piggery for one year. When piggeries were closed down was employed in firelighter department for seven hours per day for two years. He had no breakdown.

4. Single. Sputum-positive case; three lobes involved. Was a settler for 18 months. Worked five hours per day in boot-repairing department. Broke down for three months and decided to return to his people. This man's habits were not conducive to good health.

5. Single. Sputum-negative case; two lobes involved. Was a settler for 16 months. Worked seven hours per day in carpenter's shop. Decided to return to his people. Had no breakdown.

Fatal Cases.

The three deaths among the settlers occurred in 1927. All three were rather advanced cases; two had positive sputum and one had a negative sputum. They all lasted 18 months as settlers before their final breakdown. Two had never worked in the settlement for more than five hours per day, and the third worked seven hours per day. They all had short relapses from a week to a month before their final breakdown. These cases were all rather hopeless from the first, but they were made happier by being part-time employed during the last months of their lives. They lasted longer and at less expense to the community than they would have done in the outside world, and were not a source of danger to the general public.

INVESTIGATIONS ON DIET IN HEALTH AND DISEASE.

RESEARCH SUBSIDISED BY THE MEDICAL RESEARCH COUNCIL.

A CONSIDERABLE proportion of the research work now in progress under the auspices of the Medical Research Council is concerned with the relation of variations in diet to the maintenance of health or the incidence of disease. The discovery of vitamins has enmeshed dietetic experts in a maze which grows increasingly complex as the number of known accessory food factors increases. But apart from these, other dietetic questions—for example, those of sugar hunger and sugar tolerance, of the desirability of pushing or withholding protein in the diet of patients with kidney lesions, of fat indigestion, especially in children—are assuming greater and more precise importance in clinical medicine than ever before. It is, therefore, appropriate to call attention in this concluding notice of the Medical Research Council's annual report for 1928–29 to those researches carried on in all parts of Great Britain which are directly or indirectly concerned with diet.

Relation of Diet to Infection.

At Sheffield Prof. E. Mellanby and Dr. H. N. Green have been investigating the relationship of diet to infection.

It was found that when rats were fed on a diet devoid of vitamin A they almost invariably died with septic infections. When vitamin A was present in the food these infections did not develop, while the administration of foodstuffs rich in vitamin A to animals already infected often brought about complete recovery. Vitamin D did not have this preventive action; indeed it often appeared, if given unbalanced, to hasten illness in young animals, probably because it brought about more rapid growth and a quicker exhaustion of the stores of vitamin A already present in the body.

Consideration of the average diet consumed by the population under modern conditions suggested that similar influences might play some part in human resistance to bacterial infection. As a clinical study it was decided to investigate the effect of vitamin A preparations in puerperal septicæmia. This disease was selected because its case mortality is so great that with comparatively few tests a rapid inquiry could be made into the truth of the hypothesis. Although the number of cases investigated is still small, the results suggest that a definite increase of resistance to this disease is given by intensive vitamin A therapy.

So far as puerperal sepsis is concerned, the results tend to emphasise the importance of the condition of the mother before infection rather than the part played by the midwife and doctor, a view which is on the whole opposed to the present trend of thought. If, for instance, it is possible by dietetic therapy to cure cases of puerperal septicæmia, it ought to be even easier to prevent this and other forms of sepsis by proper feeding of the mother during the puerperium. To obtain evidence on this point, an investigation has been begun at the out-patient department of the Jessop Hospital, Sheffield, with the assistance of Dr. Doris Pindar. The small amount of evidence so far obtained supports this hypothesis.

Dr. Green and Prof. Mellanby are also conducting animal experiments to gain insight into the mode of action of vitamin A in septic conditions, and to find the part played by other food elements in the resistance of the body to infection. Further observations on a larger scale are contemplated to decide whether the same influences apply to other infections such as pneumonia, tuberculosis, and rheumatic fever.

Dr. W. M. Roberts has determined the effects of oils on secretion and motility of the stomach wall.

Nutritional Disorders in Infants and Young Children.

Dr. Stanley Graham and Dr. Noah Morris, working in Glasgow, have been investigating the disturbances of acid-base equilibrium in infancy and childhood, with special reference to congenital hypertrophic pyloric stenosis and cyclical vomiting. Dr. Morris and Dr. Olive Macrae are studying the mineral and fat metabolism and the variations produced by modifications of dietary in cœliac disease; while at Birmingham, Dr. Leonard Parsons, with Dr. S. H. Edgar, Miss E. M. Hickmans, and Miss M. S. Esselmont, is investigating the biochemistry of this and other diseases in children. The effects of variation in the diet on a group of children in the convalescent stage of acute rheumatism has also been studied.

Dr. Helen Mackay and Miss L. Goodfellow (London) have shown that the anæmia common in breast-fed infants is a nutritional anæmia like that already studied in artificially-fed infants. It appears that resistance to infection can be increased by the regular administration of a suitable iron salt and by the consequent prevention of this type of nutritional anæmia.

As a result of work at Guy's Hospital and elsewhere Dr. A. A. Osman has defined a condition of debility in children which is associated with acidosis, and is a milder degree of the syndrome known as "cyclical vomiting." This may be quickly overcome by giving sugar.

Studies of Growth.

At University College, London, Dr. H. A. Harris has been unable to substantiate the claims made for the superiority of irradiated ergosterol over cod-liver oil in the treatment of rickets. He holds that vitamin D can influence calcification in cartilage, but that true osteogenesis is determined by vitamin A alone. A study of susceptibility to perversions of growth has been made in the child and in the rat. The results indicate that all dietetic experiments on rats of more than 30 days old at the beginning of the experiment are unreliable, because by the fifth week the rat has ceased to grow at such a rate as to permit of the onset of acute rickets.

National Dietaries.

Dietary studies are being made at Glasgow by Prof. E. P. Cathcart, assisted by Mrs. A. M. T. Murray and Miss M. Shanks. These studies consist in the analysis over a suitable period of the diets in use in a series of typical households in various towns. Data from St. Andrews have now been completely analysed, and the results obtained are definite and informative. Good progress has also been made with the analyses of Cardiff and Reading diets, and it is hoped the

study will be completed by the investigation of one or more towns in the northern industrial area, probably in Lancashire or Yorkshire. At King's College Hospital, London, Dr. R. A. McCance, Dr. R. D. Lawrence, and Mr. H. L. Shipp have completed an analysis of carbohydrate foods, differentiating those available and unavailable for the purposes of metabolism, and have begun a similar investigation into the nutritional value of other cooked foods, especially meat and fish.

Trials of the relative values of brown and white bread have been made with rats by Prof. V. H. Mottram and Dr. G. A. Hartwell, and the results have been published in our columns. Dr. Hartwell has continued her work on synthetic diets.

Iodine in Foodstuffs.

In Aberdeen Dr. J. B. Orr, with the assistance of Miss G. L. Stuart and Mr. N. L. McPherson, has continued work on the relationship of iodine in foodstuffs to the distribution of goitre, further samples having been collected from selected English and Scottish areas. A review of existing information on iodine in nutrition, by Dr. Orr and Dr. Isabella Leitch, has been published.

Diet in Tetany.

At St. Bartholomew's Hospital Dr. G. C. Linder and Dr. C. F. Harris have investigated the influence of parathyroid extract, thyroid extract, and calcium salts in cases of tetany after operations on the thyroid gland. In tetany associated with steatorrhœa, the influence of fat in the diet and of irradiated ergosterol have been studied, and a preliminary report has been made. Satisfactory therapeutic results have been obtained.

Antiscorbutic Activity.

The Council have again received a grant from the Empire Marketing Board for the investigation of the vitamin content of various Empire food substances. The work is being done by Dr. S. S. Zilva at the Lister Institute with five assistants.

Continuing the chemical investigation of the antiscorbutic factor in lemon-juice, Dr. Zilva has studied the causes of the spontaneous inactivation of the vitamin.

Experiments on the relation to maturity of the antiscorbutic activity of citrus fruits have been begun. A group of orange trees near Jaffa has been set aside for this purpose. Consignments of this uniform yield were sent periodically during the season and examined chemically and biologically. Details of the history of the trees, such as age of stock, budding, soil, cultural treatment, climate, and conditions of picking, are known. Grape fruit from British Honduras has been similarly collected.

Dr. L. J. Harris, with Dr. E. W. Fish, is studying the effects upon tooth-structure of long-continued slight shortage of vitamin C.

The Fat-soluble Vitamins.

The inquiry into the A and D vitamin contents of Dominion dairy products, and the influence upon them of environment, has been extended to Australian butters.

With Captain Golding, of the National Institute for Research in Dairying, Reading, a study of factors causing destruction of the fat-soluble vitamins in milk has been begun by Dr. Zilva. The influence of a diet deficient in fat-soluble vitamin on the development of sensitivity to tuberculin in rats infected with *B. tuberculosis*, is being studied with Dr. H. Schütze.

Miss E. M. Hume, with Miss Henderson Smith, has studied the calcification of the bones of rats irradiated with ultra-violet light and kept on a diet as free as possible from ergosterol. At present it does not seem that calcification is limited by the absence of ergosterol from the diet.

Prof. J. C. Drummond, at University College, London, from a chemical examination of the vitamin A fraction of certain liver oils, concludes that this vitamin must form a very minute proportion of even the most active concentrates that have as yet been prepared. With Prof. Heilbron, of Liverpool, feeding tests are being made by Prof. Drummond with synthetic preparations which might be suspected of being related closely to vitamin A, and might exhibit its activities.

In the new Nutritional Laboratory at the Field Laboratories, Cambridge, Dr. L. J. Harris and Dr. T. Moore have studied the effects of giving massive doses of irradiated ergosterol. Evidence has been got that the ill-effects are due to overdosage with vitamin D itself, and not to any impurities produced during the irradiation.

With Dr. C. P. Stewart, of Edinburgh, Dr. Harris has found that experimental hypervitaminosis D in rabbits or rats is shown by raised blood phosphate or blood calcium, or both, and this state is in contrast with that observed in avitaminosis D (rickets). Mr. Innes, collaborating here, finds that the microscopic changes are the opposite of those seen in rickets.

Dr. Moore has confirmed the results of Swedish workers, who found that the pigment carotene, even after many recrystallisations, invariably has intense vitamin A activity when given in minute doses under defined dietary conditions.

Carotene and the classical vitamin A of cod-liver oil are not identical; but carotene may be a precursor of the classical vitamin A, and capable of conversion into it in vivo.

The carrot has been found to be a much richer source of vitamin A activity than was hitherto supposed. On a basis of dry weight the carrot root must approach cod-liver oil activity; and on account of its ready accessibility and cheapness this fact may have economic importance. Dr. Moore has also tested carotene for vitamin D, with quite negative results. This pigment may be a useful means for giving vitamin A, in nutritional experiments, without the vitamin D which so often accompanies it in foods.

The Minimum Nutritive Requirements of the Mammal.

Experiments have been made during the year at University College with the object of deciding what are the minimum nutritive requirements of the mammalian organism, as represented by the rat. The fact that fats are not essential constituents of the diet has been confirmed. Fat in the diet may change the demands of the organism for one or all components of the vitamin B complex, and failure to recognise this has led other workers to attribute an essential rôle to the fats as such.

Two voluntary workers, Miss F. J. Hargreaves, of Toronto, and Miss Clay, have joined in studies of the relation of animal appetite to vitamin requirement, while Dr. A. N. Drury, with Dr. C. W. Carter, of Oxford, has been investigating a cardiac irregularity noticed in pigeons fed upon polished rice.

The Water-soluble B Vitamins.

At the Lister Institute Dr. Margaret Fixsen, working under Dr. Harriette Chick, is investigating the part played in the metabolism of nitrogen by the water-soluble B vitamins.

It is probable that the presence or absence in the diet of the recently discovered heat-stable vitamin B_2 has influenced the results obtained for the "biological values" of various proteins. Some of these biological values are being redetermined by experiments in which the animals are supplied with an adequate ration of all vitamins at present known.

At Oxford Miss Vera Reader and Mr. H. W. Kinnersley have been working with personal grants on the yeast vitamin B_1 (torulin).

Mr. Kinnersley and Prof. Peters have much simplified their methods of obtaining the most active torulin concentrates, so as to work upon a large scale. By studying the changes in the brains of birds with lack of vitamin B_1 Mr. Kinnersley and Prof. Peters conclude that this want interferes with the oxidative removal of lactic acid in muscular activity, and agree that torulin is specifically concerned with carbohydrate changes in the body.

Miss Reader has again worked upon the growth-promoting activity of the purer torulin concentrates, and she has found a third factor in this very complex substance. This factor, B_3, is thermolabile, and has a curative effect on pellagra. Continuing to investigate the abnormally enhanced effect produced by impure extracts of torulin, Miss Reader has found that the addition of mannitol to a pure extract specifically imitates this abnormality. The separation of the two substances which together appear to be responsible for the physiological effects of concentrates of vitamin B_1, is being made on a large scale (so as to get quantities enough for adequate purification) by Dr. B. C. Guha and Dr. F. L. Pyman.

Miss R. Stern, working at the National Hospital, under the direction of Dr. J. G. Greenfield, has completed her study of the effects of diets deficient in vitamins B_1 and B_2 on the nervous system.

Influence of Diet on Dental Disease.

Mrs. M. Mellanby, at Sheffield, has continued her work on the relations between the original structure of the periodontal tissues and their liability to infection, and between diet and liability to infection under normal and abnormal conditions of structure, and has also, with Dr. C. Lee Pattison, obtained confirmatory evidence of the healing effects of vitamin D upon active dental caries in children. She is supervising an inquiry at Birmingham into the influence of diet on the development and extension of caries in the teeth of children.

Dr. J. R. Marrack (London Hospital) is investigating the influence of an increased intake of vitamin D, and of added calcium lactate and cod-liver oil, on the calcium content of the saliva.

At Sheffield Dr. C. G. Imrie and Miss M. Hirst have been observing the effects of diet free from creatine, and of the oral administration of creatine were also observed. Other studies have been made of the creatine and phosphorus in the muscles and in the blood and urine after giving creatine in food.

Physiology of Digestion.

Under the direction of Dr. G. A. Harrison at St Bartholomew's Hospital, Miss F. K. Herbert is studying the range of variation of the sugar tolerance in normal persons. Dr. R. J. Brocklehurst, at University College, London, has been investigating the gastric secretory response to food in animals.

Liver in Pernicious Anæmia.

At Edinburgh Dr. Stanley Davidson with Prof. Gulland have made further studies in confirmation of the work of Minot and Murphy showing the efficacy of liver treatment in pernicious anæmia. Examinations of the intestinal bacteria in this disease have shown quantitative increase above the normal, but no constant qualitative abnormality; no correlation has been found between increase of intestinal bacteria and the clinical condition.

Conclusion.

The Council announce that the trustees of the late Sir William Dunn have given £6000 for the erection of a nutritional laboratory upon a site at the Field Laboratories, Cambridge, provided by the University. This laboratory is so placed and designed as to give the most hopeful conditions for investigation in this increasingly important field of medicine. The research work here will be brought into close relations on the one side with the University departments for the primary medical sciences and on the other with the nutritional work being done in the interests of agriculture and veterinary medicine.

TORBAY HOSPITAL.—The report for the first complete year of the new hospital states that 1668 in-patients were admitted, and that there were 4266 new out-patients. The average daily cost for in-patients (146 beds) was 7*s.* 7*d.*; the average period of residence was 24·21 days.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

The Question of Reciprocity.

THE recognition of Indian Medical degrees by the British Medical Council is now in imminent danger of being withdrawn. Following the Government's failure to form an All-India Medical Council the General Medical Council was to have been pacified and the gap to have been filled by the appointment of a commissioner of medical qualifications in India. But the Legislative Assembly have refused to make this appointment. The attitude taken by the medical press here is that the General Medical Council are being dictatorial and that any attempt on the part of India to meet their wishes would be undignified. They demand that, if recognition of Indian degrees is refused, India should refuse to recognise British degrees. I understand that the question of an appointment of a Commissioner is to be dropped but that the Government is determined on the formation of an All-India Medical Council in the near future.

Proposed Central Research Institute.

The scheme for the establishment of a new Central Research Institute has received a severe set-back. The Standing Finance Committee of the Central Government have passed the annual grant to the Indian Research Fund Association only on condition that the whole Dehra Dun scheme is reconsidered by a committee appointed for the purpose. Opposition to this scheme has come from an entirely new quarter. The money which has been ear-marked for the last ten years for the building of this institution has now come to be looked upon as part of the capital of the Indian Research Fund Association, and expenditure from this capital sum will naturally curtail the research programme of the Association; the scheme was, therefore, not popular amongst research workers in India. It has always been considered by a section of the research workers that the new Institute should be located within easy reach of clinical material in one of the large Presidency towns. Some of the opposition to the localisation of the Institute at Dehra Dun was overcome when it was pointed out that this Institute would be devoted mainly to basic research and that, as there was already a suitable building at Dehra Dun which could be obtained without cost, the only expenditure would be a comparatively small sum for making certain alterations and additions. Eyebrows were lifted slightly when it was stated that this "small sum" would amount to six lakhs of rupees, and considerable sympathy with the scheme was lost when it was rumoured that the original sum mentioned was a gross underestimate and that the total expenditure on bricks and mortar alone would be more than twice this sum. Research workers feel that they have never been taken into the confidence of the Government over this scheme. The Fletcher Committee report was not circulated freely until about a year after its publication, and nothing about the additional expenditure at Dehra Dun was told to the All-India Research Workers Conference held at Calcutta last December. The need for a central Institute is admitted and most research workers are reconciled to its localisation at Dehra Dun, provided the grants which the provincial institutions—such as the Haffkine Institute in Bombay, the School of Tropical Medicine in Calcutta, and the King Institute in Madras where the more practical research problems can be tackled—have received from the Indian Research Fund Association during the last few years are not cut. Present opposition appears to be of a political nature.

Standardisation of Drugs.

At present there is no legislation which makes it necessary for drugs offered for sale in India to be

of any given standard or even to be what they purport to be, provided they are comparatively harmless. The matter has recently been taken up by the Central Government and a provision of Rs.1,10,000 has been made for the appointment of a committee to inquire into the question of importation, manufacture, and sale of medicines and drugs of impure quality or defective strength. I understand that the inquiry will be limited to drugs in common use in scientific medicine, and will not include those used in the so-called indigenous systems of medicine.

Recruitment for the I.M.S.

When this question came up before the Legislative Assembly in January one speaker urged that the time had now come for the revival of the entrance examination; the examination should, he thought, be held in India. This suggestion did not receive much support, but an amendment that the competitive examination should be revived and should be held in India and in England simultaneously received the support of the European group in the Assembly. The Government spokesman pointed out that before the war, when recruitment was solely by examination, the proportion of European to Indian admissions was 7 to 1, but that at present it was 2 to 1. He said that this proportion was not final and could be altered if a prima facie case for alteration were made out, but he considered that the resolution, in so far as it involved an immediate radical alteration in the organisation of the service, was premature. Eventually a resolution following the lines of the amendment was carried without a division.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Proposed Reform of the Vaccination Laws.

THE German Federal Health Council in their last meeting have recommended the Government to modify compulsory vaccination. The proposals are that: (1) conscientious objection of the parents should be considered; (2) the number of children to be vaccinated by any particular medical officer should not be too large, in order to allow him to examine them thoroughly to ascertain their constitutional fitness for vaccination; (3) forcible prosecutions by the police to enforce vaccination should be altogether abolished. If a vaccinated child has been injured by vaccination the State should be liable to pay damages. The decision to make these recommendations was taken on the authority of Prof. Schlossmann, the well-known specialist for children's diseases in Düsseldorf. He stated that 28 cases of post-vaccinal encephalitis were recorded in 1928—a number very small compared with the two and a half millions of children vaccinated in the same year. He was also of opinion that without vaccination the number of cases of encephalitis as a sequel to small-pox would certainly be greater. But post-vaccinal encephalitis has afflicted healthy children and has thus caused much sorrow to their parents. Cow-pox is not a local disease as was formerly believed. He described himself an absolute adherent of vaccination, but without coercion.

Notification of Diphtheria.

A medical man was lately prosecuted because he had not notified a case of diphtheria in a child who eventually died from the disease. He pleaded that he had not been certain that the child suffered from genuine diphtheria and had thus not felt obliged to notify the case. The court found him not guilty. According to the provisions of the Infectious Diseases Act (Prussia), a case of diphtheria, measles, or scarlet fever must be notified by the medical attendant within 24 hours of ascertaining the nature of the disease. If the doctor was not aware that the patient was suffering from an infectious disease he cannot be punished. The court had not to decide whether by better care he might have arrived at a right diagnosis. According to the Federal Act concerning the prevention of epidemics, including small-pox, plague, cholera, typhus, and other diseases of an extraordinarily grave and infectious character, medical men have to notify at once even suspected cases, and a medical man omitting such notification would be liable to prosecution. But that does not apply to diphtheria where notification is compulsory only after the diagnosis has been made.

Surgical Complications of Dengue Fever.

Dr. Toole reports in the *Archiv für Klinische Chirurgie* on surgical complications which occurred during the great epidemic of dengue fever in Greece. The complications affected 2000 of 650,000 patients and happened during the course of the disease or during convalescence. Among them were infectious processes produced by staphylococci and sometimes by streptococci, furunculosis, phlegmons, and parotitis. They were due partly to the fact that the resistance of the patients was diminished by the illness, but partly to external circumstances. Thus it happened that, owing to the great pressure on the medical and nursing staff, in some cases injections were not made quite aseptically. Dr. Toole does not connect dengue fever with inflammation.

The Methods of Valentin Zeileis.

The activities of Valentin Zeileis, recounted by your Austrian correspondent, have aroused interest here, for Gallspach, where he has acquired an enormous practice, lies near the German frontier. At a recent meeting of the Berlin Medical Society Prof. Lazarus, who has visited Gallspach, gave an account of his methods. According to him, Zeileis brings a Geissler tube near a patient, telling him that, when the tube is near an affected organ, the rays within the tube become more brilliant and that he is thus able to diagnose the nature of the disease. For every disease he applies the same treatment—high-frequency currents, radium and Rontgen rays, and light treatment, in that order. He treats 100 patients simultaneously in a great hall; they come three times a day for at least three weeks, sometimes for several months. If he confined his attention to hysterical patients, who are influenced by the flash of the rays, the smell of ozone, and by their own faith no harm would be done, but he and his school pretend to cure organic troubles too, and this keeps genuine patients from consulting medical men. Prof. Lazarus has reported various catastrophes that have followed this treatment. The position is complicated by the fact that Zeileis by his mass methods is able to attend daily from 1000 to 2000 patients. The whole neighbourhood thus profits from his clinic. Several hotels have been built in the small country town of Gallspach and motor-buses are in operation. The mayor and the peasants resent any doubts thrown on the efficacy of the treatment because of the prosperity brought to the town thereby. Prof. Lazarus's report has been published not only by the medical journals, but by the great Berlin daily newspapers too; its effect, however, was contrary to that expected by its author. The report has acted as propaganda; a Zeileis institute has been opened in Berlin, where the methods of the master are applied, and Zeileis has threatened to bring an action for slander against Prof. Lazarus. The Austrian authorities have left him undisturbed, possibly for financial reasons, and possibly because he has been covered by the name of his son who is a qualified medical man. He has, moreover, declared that if he is prosecuted he will go over the neighbouring Bavarian frontier and settle there, since unqualified practice is not illegal in Germany. There is obviously little prospect of success for the struggle against unqualified practice while the public prefers mystic proceedings to scientific methods.

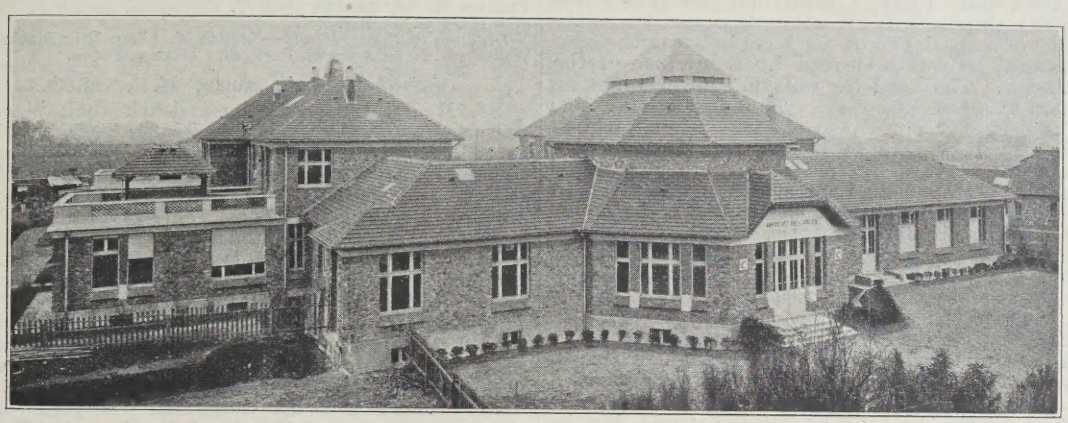
[1] THE LANCET, Jan. 25th, p. 196.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

For Public Health in France.

Two creations have just been made in France for public health. One is the *Ministère de la Santé Publique*, the other is the *Parti Social de la Santé Publique*. Of the former there is little to say, for the Minister called by Mr. Tardieu is Mr. Désiré Ferry, who is not a member of the medical profession, and is actually waiting for a staff and credits. The second creation has more interest at the moment, because no one knows what it will become in the future. The party for public health has been organised just like any political party. Its head is Senator Justin Godart, who was under-secretary to the military sanitary service during the war, where he did praiseworthy work. The party proposes to have sections all over France, and to submit candidates for election. But that is a trick to enable it to post bills on the reserved hoardings during electoral campaigns, and so oblige the ordinary candidates to consider public health questions. The first assembly of the party gathered a goodly concourse of people, and I have been told that subscriptions are coming in.



Central building of the Institute for Cancer Research of the Paris Faculty of Medicine at Villejuif.

The New Institute for Cancer Research.

Since 1921 Prof. Roussy has been head of the cancer centre for the Paris suburbs, which I have already described. That centre has grown so quickly that it can no longer be contained in its present buildings. Two years ago Prof. Roussy negotiated an agreement between the State, the Paris administration, and the faculty for the foundation of a modern institute. The laboratory department of this institute was inaugurated with a great ceremony by the President of the Republic recently. It is composed of six groups of special laboratories, plus a post-mortem service. At the same time the President laid the first stone of the clinical section that is still working in the old pavilions. The laboratories have been in occupation for two months and are considered to be the best fitted in Europe for the present.

The Leeuwenhoek-Vereeniging.

Invited for the inauguration of the institute, the members of the Leeuwenhoek-Vereeniging held their third scientific meeting. This association for the study of malignant tumours was created in 1922 at Amsterdam, under the presidency of Prof. Rotgans, and the second meeting was held two years ago in London. The British members included Dr. J. A. Murray, Dr. H. J. B. Fry, Dr. E. L. Kennaway, Dr. A. Leitch, and Dr. W. Cramer. The chairman was Prof. Roussy, and the secretary Prof. Deelman (Amsterdam). There were also present Drs. Blumenthal (Berlin), Bierich (Hamburg), Borrel (Strasbourg), Lipschütz (Vienna), Maisin (Louvain), Teutschländer (Berlin), de Vries and Waterman (Amsterdam), Askanazy (Geneva), Dustin (Brussels), Firkel (Liège), Fichera (Milan), Moller (Copenhagen), and Pentimalli (Naples).

Dr. O. Guéniot, who is 98 years of age, has received from his fellow members of the Academy of Paris a medal to commemorate his fiftieth year of membership.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Child Welfare Legislation.

SINCE 1922 Federal aid has been available in the States under provisions of the Sheppard-Towner Act. In many of the poorer States it has proved almost indispensable to programmes of health education with especial regard to maternity and infant welfare. The Sheppard-Towner Act provided aid on the basis of $5000 annually to each State and an additional $5000 if matched by State funds. This was for five years only, but in 1927 the provisions of the Act were extended for an additional two years. The Act terminated June 30th, 1929. On April 18th, 1929, a Bill was introduced into Congress by Senator Jones and Representative Cooper which was in most respects identical with the Sheppard-Towner Act, except that no outright grant was offered to the States. It provided a million dollar appropriation to be administered by the Children's Bureau, which had administered the previous Act. This Jones-Cooper Bill was supported by all the child welfare organisations. These bodies, as well as some women's organisations, including the important League of Women Voters, had been favourably impressed with the working of the Act. It was approved by the American Medical Association, but with perhaps less confidence than was the original Sheppard-Towner Act, for medical societies in the poorer States are by no means solidly in agreement with the central administration. Yet the Jones-Cooper Bill was never voted. Representative Cooper has now introduced a substitute Bill which is unlikely to satisfy anyone. The appropriation is greatly reduced and the administration handed over to the Public Health Service. It has been questioned whether, under the provisions of this Bill, any of the money will be spent directly on maternity and infancy work. President Hoover is known to take great

personal interest in child welfare work, but it is clear that he cannot control the actions of Congress unless he has behind him a solid and vocal body of public opinion. However, the women's organisations are efficient and we may expect to hear from them in the near future.

Health in Prisons.

A series of prison mutinies has given impetus to the movement for psychiatric examination of convicted offenders. At a recent hearing of the New York State Crime Commission this policy was repeatedly emphasised. A suggestion for the establishment of a special court for boys between the ages of 16 and 18 was approved by a number of the commission. The need for relieving idleness among prisoners was also discussed. The situation in New York is certainly not worse than in other parts of the country if we are to believe the findings of a nation-wide survey of Federal and State penal institutions. More than 100 institutions are reviewed in the report of this survey, the health and medical aspects being presented by Dr. Frank L. Rector, the executive secretary of the Chicago Medical Society. "With few exceptions," he says, "the prison hospitals are greatly understaffed." Seldom is the physician also the administrative head of all health and hospital activities. The equipment in many prison hospitals leaves much to be desired. "Health education is badly neglected." It is recommended that actively tuberculous prisoners be not paroled unless adequate care by relatives is assured, but be transferred to a suitable institution for treatment. Recommendations are also made for the segregation of drug addicts and of the insane, as well as for the improvement of prison diet and of recreation facilities.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Death of Sir John Fagan.

THE recent death of Sir John Fagan, at Portarlington, removes from Irish medical circles a well-known public man. He obtained his medical qualifications from the Irish Royal Colleges no less than 65 years ago, and proceeding to the Fellowship of the Royal College of Surgeons in Ireland in 1874, must have been among the oldest, if not actually the senior, Fellow at the time of his death. He was for many years surgeon to the Royal Victoria Hospital, Belfast, but retired from practice in 1897 on his appointment as Inspector of Reformatories and Industrial Schools. Some years later he was appointed to the Prisons Board, and on the cessation of this office he went to live at Portarlington, where he died.

Royal Victoria Hospital, Belfast.

Captain H. G. H. Mulholland, Speaker of the House of Commons of Northern Ireland, presided at the 137th annual meeting of the Royal Victoria Hospital, held in the King Edward VII. Memorial Hall of the institution on March 28th. The annual report showed that during 1929, 6237 patients were treated in the wards, and extern patients numbered 55,090. The cost of running the hospital for the 12 months came to £61,643, against which the revenue was £59,812. The deficit is small, while it is of deep significance that important developments are taking place. The building of a new Maternity Hospital has actually begun, although £50,000 of the £130,000 required is still lacking. A scheme for a pay patients' department for people of moderate means—an urgently needed reform—is being held up pending the erection of a new nurses' home, but there is every hope that both will materialise. A fine new children's hospital is being erected close to the Royal Victoria, and the proposed housing of the Pathological and Bacteriological Department of the Queen's University in a new institute in the same grounds shows that the great scheme of having the whole medical school in the closest proximity to the clinical hospitals is no longer a dream but is taking concrete shape.

Queen's University of Belfast.

At the spring graduation ceremony on March 28th the following degrees in the Faculty of Medicine were conferred :—

Doctor of Medicine—Samuel Hayes and Jane A. D. Maclean.

Bachelor of Medicine, Bachelor of Surgery, and Bachelor of Obstetrics—James H. Colhoun, Margaret M. Conway, Charles E. Emerson, George R. Garvin, Stanley B. Hughes, Robert J. Huston, William M'Bride, Henry J. M'Shane, Gordon F. Magurran, Nora Maybin, Phyllis E. Minford, Hector F. Northey, Thomas H. W. Ritchie, Cecil V. Stevenson, James B. Young, and Mary C. Young.

Diploma in Public Health—Letitia M. Allen, Eric Blackstock, William F. Lyle, Anna R. Park, and Thomas Purce.

Robert Harper Sproule, M.D., M.Ch.

Dr. R. H. Sproule, whose death took place at Killyleagh, County Down, on March 26th, was born in 1855 in County Tyrone, and took his university courses in Arts and Medicine in the Queen's College, Belfast, and graduated M.D., M.Ch., in 1881. He was appointed dispensary doctor for Killyleagh in 1888, and held that post until four years ago. Known and respected throughout a large part of Down his resignation from dispensary duties furnished his numerous friends with an opportunity of paying him a well-deserved presentation. Dr. Sproule had a remarkable memory. He could tell the birthday of every boy and girl born in his district during his period as medical officer. He was a noted "sermon taster" and woe to the clergyman who preached an old sermon in Second Killyleagh Presbyterian Church, as Dr. Sproule could repeat word for word any sermon heard for years back and could give the date of its delivery. He was a lover of all kinds of sport, especially cricket; ran the local football club, and presented all the necessary equipment to the boys. His memory will linger for a long time by the lovely shores of Strangford Lough, where his long life was spent in the unselfish service of others.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 22ND, 1930.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 361 (last week 433); scarlet fever, 2440; diphtheria, 1620; enteric fever, 55; pneumonia, 1462; puerperal fever, 47; puerperal pyrexia, 115; cerebro-spinal fever, 16; acute poliomyelitis, 3; encephalitis lethargica, 10; dysentery, 2; ophthalmia neonatorum, 115. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on March 25th–26th was as follows: Small-pox, 545 under treatment, 23 under observation (last week 587 and 26 respectively), scarlet fever, 2137, diphtheria, 2738, enteric fever, 18, measles, 1078, whooping-cough, 78, puerperal fever, 22 (plus 12 babies); encephalitis lethargica, 123; poliomyelitis, 1; "other diseases," 30. At St. Margaret's Hospital there were 12 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns including London there was no death from small-pox, 5 (1) from enteric fever, 119 (67) from measles, 16 (5) from scarlet fever, 35 (6) from whooping-cough, 40 (13) from diphtheria, 56 (16) from diarrhœa and enteritis under two years, and 67 (10) from influenza. The figures in parentheses are those for London itself.

The deaths from enteric fever outside London were reported from Reading, Birmingham, Bolton and York, each 1. The fatal cases of measles were concentrated at Manchester, 11; Sheffield, 8; West Ham, 5. (Glasgow also reported 15 deaths.) Whooping-cough claimed 8 victims at Birmingham; diphtheria 5 at Liverpool. Diarrhœa accounted for 6 deaths at Manchester and 4 at Liverpool. The highest figures for deaths attributed to influenza were Birmingham, 4; Stoke-on-Trent, 3. The monthly statement of deaths from small-pox in England and Wales for February contains one death assigned to Meltham U.D. (Yorks, W.R.).

The number of stillbirths notified during the week was 319 (corresponding to a rate of 48 per 1000 births), including 63 in London.

Correspondence.

"Audi alteram partem."

ATHLETICS IN SCHOOLS.

To the Editor of THE LANCET.

SIR,—I have read Dr. Lempriere's address and the discussion which followed its delivery in THE LANCET of March 29th with considerable interest, and must say that my experience has led me to agree with many of his conclusions. Unfortunately, I did not have the privilege of being present at the discussion at the Hunterian Society, but there are some points which, to my mind, cannot be too strongly stressed. The competitive spirit of athletics tends to be given too prominent a position in schools at the present day, and it is this concentration on the competitive factor, and the "cock-house" spirit, that forms the potential danger. Do we not all know how the Cup-tie keenness ruins hospital football and reduces the standard of play?

The recent realisation of the advantages of athletics as a means of sublimating that inherent dynamic energy that lies dormant in each and everyone of us has given sport an undue prominence in the public eye. School authorities have seen that by directing this energy along athletic channels they can obtain for it an outlet that prevents it from being manifested as mischief or immorality. Compulsory sublimation, however, is unsound, and for that reason I am definitely against compulsory games.

Dr. Simey strikes the correct note when he says that "spontaneity in recreation is essential," and in considering school games I would focus the attention, not on the word "athletics," meaning "contest," but on the word "recreation," meaning a refreshing or restoring of energy, and ask sports masters and others in authority to look upon the outdoor activities as an opportunity for the recreation of energy rather than as an expenditure to the limit of exhaustion. If the boys are thereby taught the right use of leisure it will be of lasting benefit to them all their lives, and we shall not have the tired and harassed business man dashing off at the week-end to take part in a strenuous golf competition which only leaves him still more tired and harassed at the end. The long road run, the cross country and competitive steeplechase are forms of recreation to be deprecated. Much greater benefit is derived from a medium course of one to three miles covered by a series of alternating hundred yards run and hundred yards walk, with an occasional fifty yards sprint. The efforts in such cases are short and sharp, monotony is avoided, and periods of comparative rest are provided.

Rowing is another sport that requires careful consideration. It is particularly fascinating, but unfortunately certain muscles are undoubtedly overworked at the expense of others, while the return flow of blood from the lower half of the body is not adequately provided for. Provided the individual is of good physique and sound constitution he will derive benefit from rowing, but otherwise he may do himself more harm than good. Certainly the middle-aged man, formerly a rowing man, is a distinct medical problem at the present day, though it is difficult to say how much of his disability is due to the rowing itself or to the faulty methods of training that were in vogue in the last century.

Rugby football, in that it requires a considerable "amount of contortional ability," would seem to stand fairly high in Captain Martin Flack's classification, but I think that it should not be widely indulged in by boys of preparatory school age. Its increasing popularity with the public of recent years has led to an outcry for speeding up the game and making it more spectacular, but the Rugby Union very wisely are averse to this, and base their legislation by visualising the normal schoolboy as the standard by which the game is ruled. To speed up the game beyond the capabilities and endurance of lads of 16 would be detrimental both to the game and the youth of the nation. I would encourage junior boys below public school age to engage in running, gymnastics, and Association football as their winter pastimes, while boxing and Rugby football can be developed later.

Sport certainly plays a big part in character building and in the development of the adolescent, but in certain quarters it is apt to bulk too largely in the curriculum. We must guard against making a fetish of games and neglecting other forms of recreation. Fatalities are few, and my limited experience coincides with that of Dr. Lempriere in bearing out the truth of Sir Clifford Allbutt's dictum. It is almost impossible for a healthy trained athlete to dilate his heart, and the young adolescent has a wide margin of elasticity. When trouble does occur it is usually the result of faulty training, or due to excessive exercise following some infectious disease, such as tonsillitis, influenza, subacute rheumatism, &c., the significance of which has not been recognised. Consequently, adequate supervision is essential. The fallacies do not seem to lie in the games themselves, but in the administration when it is carried out by enthusiastic but inexperienced prefects or young over-zealous housemasters, while the frequent fostering of the competitive spirit, and the glorification of the individual, are bound to have detrimental effects.

I am, Sir, yours faithfully,

R. COVE-SMITH.

Cambridge-terrace, Hyde Park, W., March 31st, 1930.

To the Editor of THE LANCET.

SIR,—Neither in the very interesting paper on Athletics in Schools, read by my friend Dr. Lempriere before the Hunterian Society, nor in the subsequent discussion, does there seem to have been any adequate consideration of diet in relation to athletic heart strain. Dr. Lempriere very properly emphasised the fact insisted upon by Bainbridge in his Physiology of Muscular Exercise, that "not only is the heart normally equal to the demands placed upon it, but in a perfectly healthy man even the most intense exertion of which he is capable has no harmful effect upon the heart."

Of the causes which render a heart unhealthy to the point where it strains on relatively slight exertion, Dr. Lempriere finds trifling attacks of influenza to be the most redoubtable, because they are liable to go unnoticed—a matter in which every one will agree. It is probable that the heart, like other organs, has its favourite poisons so to speak, and that among the more acute kind those of influenzal and kindred air-passage infections are the most frequent, except, of course, the truly rheumatic. But there are other toxins of a more chronic kind, which render the heart liable to strain under seemingly slight provocation, and they are the toxins which come from within. These are even more redoubtable than the toxins of the influenzal type, not only because no one seems to remember them, but because boys vary enormously in their susceptibility thereto. And these endogenous toxins can only come from faulty dietetics—a moment's consideration compels this conclusion.

I realise that in large communities it is very difficult indeed to cater for the physiological non-conformist, but I think that although recent advances in dietetics have vastly improved matters in most schools, there still remains room for much reasonable reform. Why, for instance, is a lusty lad—whose face is covered with acne, given large and repeated slabs of butcher's meat at school, when it has been proved that the absent slabs in the holidays means the disappearance of the acne? And if this can happen it is more than likely that poisons similarly generated can functionally tarnish the heart. I am personally persuaded that a good many albuminurics come into a closely neighbouring category.

I am, Sir, yours faithfully,

LEONARD WILLIAMS.

St. James's-place, S.W., March 28th, 1930.

DAWSON WILLIAMS MEMORIAL FUND.

To the Editor of THE LANCET.

SIR,—As honorary secretary of the Dawson Williams Memorial Fund Trustees, I beg to inform you that at a recent meeting of the Trustees it was resolved that the first award of the Memorial Prize be made to Dr. F. J. Poynton, senior physician to the Hospital for Sick Children, Great Ormond-street, for his work on behalf of rheumatic children, particularly with regard to the establishment of special "rheumatic centres."

Your readers may like to be reminded that the establishment of this prize was due to a desire to commemorate the work of the late Sir Dawson Williams, Editor of the *British Medical Journal*, and in view of his special interest in the question of pædiatrics it was resolved that the interest accruing from the funds collected should be devoted to a prize in connexion with that subject, to be awarded every two years, or at longer intervals, in the discretion of the Trustees, who are the Presidents for the time being of the Royal College of Physicians of London, the Royal College of Surgeons of England, the British Medical Association, the Royal Society of Medicine, the Section of Diseases of Children of the Royal Society of Medicine, and the Editor of the *British Medical Journal*. The prize is open to any registered medical practitioner in the British Empire, and takes the form of a cheque for 50 guineas.

It is hoped that the presentation of the prize may be made by the President of the British Medical Association at the annual meeting of that body at Winnipeg in August next.

I am, Sir, yours faithfully,

ALFRED COX,
Honorary Secretary of Fund.

British Medical Association House, Tavistock-square, London, W.C., March 29th, 1930.

ÆTIOLOGY OF ENCEPHALOMYELITIS FOLLOWING SMALL-POX.

To the Editor of THE LANCET.

SIR,—Prof. McIntosh has very clearly stated the alternative points of view as to the cause of encephalitis after vaccination or as a complication of small-pox—viz. (1) that the encephalitis is caused by the disease lowering the patient's resistance to another virus—e.g., that of encephalitis lethargica, or (2) that it is caused by the vaccinia or small-pox virus itself. He does not mention recent observations made in Holland, which appear to confirm the first view, the isolation from the throats of such cases of a small Gram-negative bacillus believed to be the cause of the encephalitis. It is suggested that this bacillus is the influenza bacillus. Prof. McIntosh's view I believe to be correct, the transmission of vaccinia by such brain material ought to leave the matter in no doubt.

The finding of the microbacillus is to me of peculiar significance, but the interpretation of its nature is, I believe, mistaken, for I have proved such a microbe to be the cause of fowl-pox by curing and preventing the disease with an antigen of it, and confirmed this proof of pathogenicity by transmitting the disease with a pure culture of it. If the proper cultural precautions are taken, such microbacilli can always be isolated from the throats of small-pox cases, and if the vaccine lymph or material from the poxes of small-pox is inoculated on the mucous membrane of a rabbit's nose the filter-passing virus form will develop into the microbacillus. I have been able to protect rabbits from vaccinia with a killed antigen of this microbe. It is significant to me that in the diseases in which the form of encephalitis appears, which is referred to by Prof. McIntosh, vaccinia, small-pox, measles, mumps, distemper, influenza, such minute bacilli, which furnish us with powerful therapeutic antigens, can be isolated if the proper cultural precautions are taken. My view is, therefore, that the virus is the filter-passing phase of a microbe which on mucous membranes is in the form of a bacillus.

This view that microbes can break up into or assume such minute forms in such environments as living tissues is so unpopular that it is not mentioned, and if a microbe visible by the ordinary microscope appears in filtered material it is at once rejected as a contamination. The matter is of great therapeutic importance, as a killed antigen of the filter-passing phase appears to be of poor antigenic quality, while a live virus which is a powerful antigen will produce disease in a percentage of those inoculated.

I am, Sir, yours faithfully,

Dublin, March 21st, 1930. W. M. CROFTON.

EXPENDITURE IN VOLUNTARY HOSPITALS.

To the Editor of THE LANCET.

SIR,—One is constantly aware of the efforts being made by the voluntary hospitals to collect the funds which are necessary for the successful running of such admirable institutions. So much thought is given to the effort to increase income that the reduction of unnecessary expenditure does not seem to have had sufficient attention. May I be allowed to point out some directions in which I consider that unnecessary expenditure is being incurred by the voluntary hospitals, and suggest remedies for these.

(1) *Indiscriminate Admission of Patients to the Out-patient and Casualty Departments.*—I would suggest that, apart from emergencies, all patients at their first visit should pass through the almoner's department, and that only those who bring a letter from a doctor, or successfully prove that they are not insured under the National Health Insurance Act, or prove that they are too poor even to afford the most modest doctor's fee, be passed through. This, of course, would bar all persons entitled to medical benefit under the Act, and all those able to contribute to such a contributory scheme as has been running in London and many other parts of the country for several years. Such schemes, for the moderate sum of 3*d.* or 4*d.* per head per week, provide the patient with a family doctor who agrees to give him general practitioner treatment when necessary. This would lessen the crowding of out-patient departments, and also their expense, which must constitute a considerable part of the expense of running a voluntary hospital. I do not think that the consultants working in out-patient departments wish to treat minor ailments, and for teaching purposes these are of little value. So that this would also relieve the consultant of a mass of work which he does not want, and would allow him to resume his rôle of consultant. Also he would have less work to do in the out-patient department, and would have more time to teach on the cases that came up for an opinion.

(2) *Provision of Large Quantities of Medicines.*—I do not know what the drug bill of a large voluntary hospital amounts to during a year, but it must be very large, considering that nearly every patient leaves the casualty and out-patient departments with a large supply of medicines. One hears a great deal about the enormous quantity of drugs swallowed by the insured population. Is not this tendency perhaps a little stimulated by the treatment they receive when they go to hospital? I would suggest that a start be made by the voluntary hospitals in the education of the public against the medicine habit. This can be done much more easily in a hospital than in general practice. Again, when a patient is sent up by a doctor for an opinion or for some such treatment as is outside his scope—e.g., X ray and physiotherapy—and the patient is already receiving medicinal treatment from his general practitioner, is it necessary for the hospital to give him a further

supply of medicine? I would suggest that in such cases advice be given to the doctor, and only such treatment given to the patient as cannot be given by his private doctor.

(3) *Extended Use of Hospital Contributory Schemes.*—Large numbers of patients who contribute to such schemes as the Hospital Savings Association attend the voluntary hospitals for minor ailments, and receive medicinal treatment. No charge is made to these patients. I would suggest that under such schemes only such treatment should be given as cannot be given by a general practitioner, and that such contributions should be reserved for such things as, I believe, they were originally intended—e.g., in-patient treatment, operations, consultations, X ray, physiotherapy.—I am, Sir, yours faithfully,

Westbourne Park-road, March 29th, 1930. J. COHEN.

CLINICAL RESEARCH.

To the Editor of THE LANCET.

SIR,—It is always of interest to learn the views of others; and for this reason Dr. Frewen Moor's letter in your issue of March 29th (p. 724) is deserving of notice. It helps to explain many things. Let me give an instance. Some time ago I saw a case of typical sprue which had been under treatment over a continuous period at the hands of four medical men.

No. 1 diagnosed the case as dysentery, mainly, as far as can be ascertained, from the fact that the patient had lived in the tropics. There can be no doubt of the assiduity with which the treatment was carried out, for the patient had a course of emetine, followed by antidysenteric serum (presumably polyvalent), and finally a period of lavage of the colon. Eventually he recommended a "change of air" to the seaside, where the patient, much emaciated, came under the care of No. 2.

No. 2 made a very thorough examination of the patient as a result of which he stated that the patient was suffering from tuberculosis, and after several weeks of treatment, recommended him to go to the south of France, where he met No. 3.

No. 3 also carried out a routine examination, and at all events deserves credit for having recognised the "sore tongue," on the evidence of which, together with the patient's general condition, he diagnosed pernicious anæmia.

As Dr. Moor justly remarks, there are many methods of treating the same disease, but I cannot agree that all are equally effective; for No. 3 had all the patient's teeth extracted, although they do not seem to have been at all bad, and subjected him to a course of arsenic in increasing doses (this was in 1929). There was still no improvement, and the patient steadily deteriorating in health, decided to return to England, as he feared, to die. On his arrival he went to see No. 4, who during the war had had tropical experience and who had no hesitation in correctly diagnosing sprue. With appropriate treatment the improvement, in the patient's own words, was "a miracle."

It would appear to the ordinary individual that in such a case diagnosis comes first, not only in order of time, but also of importance. It is possible to recall many similar instances: subacute combined degeneration of the cord, with pernicious anæmia, diagnosed and treated as locomotor ataxy; early locomotor ataxy with lightning pains treated for two years as rheumatism; glycosuria due to a lowered renal threshold diagnosed and treated as diabetes mellitus, and so ad infinitum.

I am one of the old school, and believe that all treatment, to be successful, must be based upon an accurate diagnosis. Dr. Moor appears to agree with this in his concluding paragraph.

I am, Sir, yours faithfully,

March 28th, 1930. M.D., F.R.S. EDIN.

HENRY HILL HICKMAN MEMORIAL.

APPEAL CLOSED.—LORD DAWSON'S ADDRESS.

THE Committee report that the total sum received amounts to £256 10*s.* 6*d.*, and that the appeal is now closed. Hickman's family grave and tombstone have been restored and renewed and a tablet engraved by Mr. Eric Gill is to be unveiled in Bromfield Parish Church, Ludlow, by Sir StClair Thomson, late President of the Royal Society of Medicine, to-day (Saturday), April 5th, at 2.45 P.M. This will be followed by a dedication by the Rt. Rev. The Lord Bishop of Hereford. The balance of the fund will be devoted to establishing and endowing a medal for research and original work of merit in connexion with anæsthesia. Further particulars, including the names of the Trustees appointed, will be published later. The letter announcing the closing of the appeal, which is signed by Lord Dawson of Penn, Sir StClair Thomson, Mr. V. Warren Low, Hon. Treasurer, and Dr. Cecil Hughes, Hon. Secretary, expresses on behalf of the Committee cordial thanks to the numerous colleges, faculties, learned societies, and individuals who have so readily supported this appeal. The list of subscribers is as follows:—

Royal College of Physicians of London.
Royal College of Surgeons of England.
Royal College of Surgeons of Edinburgh.
Royal Society of Medicine.
Association of Surgeons of Great Britain.
British Medical Association.
Canadian Medical Association.
University of Birmingham: Faculty of Medicine and Dental Clinical Board.
University of Durham: Faculty of Medicine.
King's Coll. Hosp. Med. School.
St. Thomas's Hosp. Med. School.
Royal Dental Hospital: Medical Committee.
University of Oxford: Faculty of Medicine.
Bath and Bristol Surgical Club.
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Mr. A. W. Adams, F.R.C.S.
Dr. R. E. Apperly.
Lady Berry, M.D.
Dr. W. R. Bett.
Mrs. Bettridge and descendants of Hickman's daughter, Hannah.
Dr. A. D. Blackadder.
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Dr. E. W. Ainley Walker.
Dr. Henry S. Wellcome.
Sir William Wheeler, F.R.C.S.
Mr. A. J. Wright, F.R.C.S.

LORD DAWSON'S ADDRESS.

In his address to the Section of Anæsthetics of the Royal Society of Medicine, delivered on April 2nd during a reception at the Wellcome Historical Medical Museum, Lord Dawson having estimated the work of Hickman by picturing briefly the state of knowledge and thought belonging to the day continued: To Hickman is the credit of appreciating the sufferings inflicted by surgical operations and the conception of means to alleviate them by the production of insensibility. In a letter dated Feb. 21st, 1824, Hickman wrote: "I have frequently lamented, when performing my own duties as a surgeon, that something has not been thought of whereby the fears may be tranquilised and suffering relieved." Further, he was the first to put his ideas to the test of experiment. Hickman rendered animals unconscious first through partial asphyxiation by the exclusion of air, then by inhalation of carbonic acid, and later of nitrous oxide. During anæsthesia he made incisions, applied ligatures, amputated ears and limbs, without pain and with good surgical results. His earnest purpose was to extend the benefit of his findings to man. To this end he published (August, 1824) his famous pamphlet, "A Letter on Suspended Animation, containing experiments showing that it may be safely employed during operations on animals, with the view of ascertaining its probable utility in surgical operations on the human subject, addressed to T. A. Knight, Esqr., of Downton Castle, Herefordshire, one of the Presidents of the Royal Society." This pamphlet, a witness of the scientific spirit and method, is published in full in the Hickman Centenary Book, for the issue of which a debt of gratitude is due, not only to the author, but to the Wellcome Museum.

Hickman's researches, said Lord Dawson, were ignored by the medical profession in his own country, in spite of the friendship of Knight for Davy, the then President of the Royal Society, so in April, 1828, he went to Paris and presented to King Charles X. a memorial praying that his work might be presented to the French Academy of Medicine. This was done and a Commission was appointed. But no investigation followed. The work to which he had sacrificed his career failed of recognition alike in France and England. Hickman returned home and died shortly afterwards at the age of 29. How strange is the continued apathy thus disclosed, and yet it continued for a further 13 years. From 1831 onwards a fashion arose of inhaling ether and to a less extent nitrous oxide to the point of excitement and even intoxication for motives of curiosity or fun. For students and other youths such inhalations became a pastime—they were the cocktail parties of the early nineteenth century. Still the scales did not fall from the eyes of the surgeons. During one of such frolics a negro boy was dragged in, ether administered, with the result that insensibility followed, and despite the (to us) obvious application it was not till 1842 that a young dentist, Crawford Long, used ether for a definite surgical purpose.

Then events followed more quickly. Wells, in 1844, employed nitrous oxide for anæsthesia. Morton, unaware of Long's work, administered ether in Massachusetts General Hospital in 1846—the first public use of anæsthesia. Then a year later, Flourens, the distinguished physiologist, described the effects of chloroform on the lower animals, and following this chloroform was employed at St. Bartholomew's Hospital by Sir William Lawrence, and in Edinburgh by Sir James Simpson, who published the details of 50 cases in which he had administered chloroform with success.

THE Ludwig Darmstaedter prize with the Paul Ehrlich medal for outstanding scientific work in chemotherapeutics and biology has been awarded by the Council of the Georg-Speyer-Haus Foundation jointly to Dr. Ernst Meinicke, director of the serological institute and sanatorium at Ambrock, and to Prof. Hans Sachs, director of the institute for experimental cancer research at Heidelberg, for their serological investigations, more particularly in the diagnosis of syphilis.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

MENTAL TREATMENT BILL.

THE Mental Treatment Bill was further considered by Standing Committee A of the House of Commons on Thursday, March 27th. Mr. CECIL WILSON was in the chair.

Power to Make Rules.

On Clause 15 Mr. WOMERSLEY moved to add at the end of the clause the following words:—

"The Board of Control shall, before making any rules under this Act or the principal Act, consult the associations representing the county and county borough councils and the visiting committees."

He said that he moved the amendment on behalf of the associations representing the county councils and county boroughs, who felt that they ought to be consulted before these rules and regulations were framed by the Board of Control. The feeling of the authorities was all the stronger in view of the fact that the Minister of Health was not able to accept the amendment moved to Clause 14 at the previous meeting of the Committee, which would have given a right of appeal to the Minister of Health on any question of dispute between the local authorities and the Board of Control.

Mr. GREENWOOD (Minister of Health) said that even if this amendment were desirable, it went much further than anything the local authorities had ever asked for. It would compel the Board of Control to consult these associations on matters with which they were not directly concerned, or regulations affecting registered hospitals, and licensed houses which were not part of the direct business of the local authorities. There had grown up, as everyone was aware, in the Ministry of Health a method of very full consultation with local authorities on all matters even indirectly affecting them. That was done without any legal compulsion of any kind. There need be no fear on the part of the local authorities that they would not be fully consulted. He objected to this principle of compulsion. Very often the medical profession had urged upon Ministers of Health that local authorities should be required to consult the representatives of the profession on all kinds of questions affecting the public health. That claim had always been resisted on two grounds. In the first place if negotiations did not go very well, there might arise on the part of the local authorities a policy of only carrying out the minimum consultation required by the law and no more. In the second place it had been urged that the local authorities were responsible to the rate-payers and were entitled to carry on their work in their own way. That was not to say, however, that very close coöperation and consultation between the medical profession and the local authorities was not desirable and very useful, but the case was that to exercise compulsion did not achieve the best results. There was an exact parallel in the case of the amendment moved by Mr. Womersley, and he hoped that he would not press his point.

Dr. VERNON DAVIES asked if it would be possible for the Minister to issue to the associations of municipal corporations and county councils any rules which it was proposed to issue with a view to getting their opinion upon them?

Mr. GREENWOOD said it was the custom to circulate draft Rules beforehand. He was prepared to give a specific pledge that from now onwards there would be the closest coöperation in the formation of these rules, and that they would be placed in the hands of local authorities before they were put into operation.

Mr. WOMERSLEY said in view of the definite pledge of the Minister he would withdraw his amendment.

The amendment was withdrawn. Clause 15 was added to the Bill.

Medical Protection.

On Clause 16 (Amendment of Section 330 of the principal Act)

Mr. GREENWOOD moved in Subsection (1) (i) after the word "report" to insert the words "application, recommendation." He said it would be seen that the clause as drafted reproduced the reference in Section 330 of the principal Act with regard to petition, reception order report, certificate, and so on. They had introduced two new terms into the procedure under the early clauses of this Bill. In Clause 1 (1) there was the application in the case of a voluntary patient, and in Clause 1 (2) a medical recommendation in the case of a minor. These terms were also used with regard to temporary patients in Clause 5. As it was essential to give the protection afforded by

Section 330 of the principal Act to persons coming within this Bill, it was intended to add these words.

Lieut.-Colonel FREMANTLE said he had put down a similar amendment, and the medical members were grateful to the Minister for accepting the principle and enlarging it.

The amendment was agreed to.

Mr. GREENWOOD moved an amendment to Subsection 1 (i) to insert after the word "Act" the words "or any Act amending this Act." He said the words "this Act" meant the Act of 1890. In order that the words might cover the present Bill this amendment was necessary.

Dr. DAVIES: Will this also apply to prospective legislation?

Mr. GREENWOOD: Yes, in so far as it applies.

The amendment was agreed to.

Dr. MORRIS-JONES moved an amendment to Subsection (1, 1), to leave out the words "without reasonable care," and to insert instead the following "negligently and without reasonable and probable cause. Provided that in the case of a trial with a jury the question of reasonable or probable cause shall be determined by the Judge."

Mr. GREENWOOD said there were three amendments on the paper which attempted to deal with the same point—namely, the desire to give fair protection to the medical profession against unfair and vexatious actions. It was important that that should be done. The matter was considered at great length by the Royal Commission, and two distinguished lawyers on the Commission. Mr. (now Lord) Macmillan and Mr. (now Sir William) Jowitt, the Attorney-General, drafted very carefully the wording which had been incorporated in the Bill. Subsequently he (Mr. Greenwood) met representatives of the British Medical Association. While he could not agree with their claim for absolute privilege, as he felt there must rest on the medical man a certain responsibility, he stated that he was prepared to consider whether he could go a little further if it could be done properly. Dr. Morris-Jones's amendment was open to a number of objections. If the Committee felt that Parliament ought to go a little further, he (Mr. Greenwood) had prepared a new form of words, which he would be glad to move later as an alternative.

Dr. MORRIS-JONES said in view of the Minister's explanation he would withdraw his amendment.

The amendment was withdrawn.

Lieut.-Colonel FREMANTLE moved in Subsection (1, 2) to leave out the words:

"such proceedings shall, on application to the High Court, be stayed on such terms as to costs and otherwise as the Court may think fit, unless the Court is satisfied that there is substantial ground for alleging that such act was done in bad faith or without reasonable care."

and to insert instead the following:—

"(*a*) The person taking such proceedings shall apply to the High Court for leave to proceed therein after service of the writ and before taking any further step in the said proceedings. Fourteen days' notice of such application shall be given to every other party to the said proceedings. Upon hearing such application the Court shall refuse leave to proceed and shall stay the said proceedings on such terms as to costs and otherwise as the Court thinks fit, unless the Court is satisfied that there is substantial ground for alleging that such act was done in bad faith or without reasonable care. (*b*) Where the person taking such proceedings shall have taken any further step therein after service of the writ and without having obtained leave to appeal upon an application for leave to proceed as required by sub-paragraph (*a*) of this Subsection or where the said person has taken no further step therein after service of the writ, and failed to make such application for leave to proceed within a reasonable time from the date of service of the writ, the High Court shall, on the application of any other party to the said proceedings, stay the said proceedings on such terms as to costs and otherwise as the Court thinks fit."

He said that under the principal Act, Section 330, a medical man who signed a certificate might be challenged by a patient, or a relative of a patient, or other interested person, and might be sued, but it was provided that "he shall not be liable to any civil or any criminal proceedings if he has acted in good faith, and with reasonable care." The difficulty, however, had been the interpretation of the law. In the Hume-Spry case, Lord Justice Banks held as a result of reading the Section that "if there was any scintilla of evidence to go before the jury in respect of the claim then the claim could not be withheld from the jury." That meant that the safeguard in the Section was no safeguard. Many cases had come before the courts, although eventually they had been shown to be frivolous and unnecessary. On the other hand, they had a case in December of last year, Easton *v.* Potts and Johnson, which was decided against the doctors by the Master in Chambers, not on the ground that he was not satisfied of their good faith, but that he was not satisfied that they had shown evidence of reasonable care. The judgment was reversed on appeal, and the remarks of Lord Justice Scrutton were very much to the point:

"He emphasised the importance of protecting those who, at the invitation of Parliament, fulfil a duty in the interest of the community as well as of the patient. If any doctor certifying is to be exposed to the cost and danger arising after the event of judgment—by people who did not see the patient at the time—that the patient at that time was not of unsound mind, the only effect and the natural effect would be that no doctor would certify, and that the community, which is to be protected as well as the individual, would be exposed to the risk of having persons of unsound mind wandering about without adequate control, to the danger of themselves and possibly to the danger of the community. We have had a series of cases in recent years showing the risks to which doctors are exposed by actions alleging that they have certified improperly either dishonestly or without due care. It is common knowledge that the result of these cases has been that many doctors will not certify at all. They will not run the risk of undertaking the duty Parliament seeks to put upon them."

That was the position which was dealt with by the Royal Commission, who were very emphatic on the subject. They said that the medical man was not compelled to certify, that he was doing it as a public service, and that if he was going to run the risk of being mulcted in damages, even up to £30,000, although such judgment might be reversed on appeal, still he had all the anxiety and worry, and it was not worth while for the sake of a few guineas or a few shillings to run the risk. After going through their recommendations the Royal Commission said:

"The complete co-operation of the medical profession is vital to the proper administration of the Lunacy Code. But they are at present performing these duties with increasing hesitation and reluctance; and the position revealed by the evidence leaves little room for doubt that unless some relief is found for the situation without delay a breakdown in the system is inevitable."

That was the position which the Committee were faced with. It was not merely a question of ordinary professional justice. The point was how they could prevent a breakdown of the system and get medical men, who were the only persons who could supply this service to the community, to undertake the work in the interests of the public. It was natural that evidence was taken from the British Medical Association, which represented something like two-thirds or three-quarters of the profession. The Minister of Health had said he could not go as far as the original proposal of the British Medical Association, and grant complete privilege. He (Colonel Fremantle) had reason to believe that the British Medical Association recognised that it would be difficult for Parliament to grant complete privilege. That being the case they consulted a distinguished lawyer and King's Counsel, who was also the member for Holborn (Mr. S. Bevan), under whose direction the amendment which he (Colonel Fremantle) had moved, was drafted. If the Committee agreed to this amendment, a further amendment was suggested to enable the Court at their discretion to sit with an assessor, either a medical man or a lawyer, who would be nominated by the Lord Chancellor from a panel recommended by the President of the British Medical Association. That would give greater confidence to the medical profession. There was nothing mandatory about the amendment.

A Possible Alternative.

Mr. GREENWOOD said it would not be fair to expect the Committee to adopt the amendment that morning, because it really was one for the Report stage. He would like, however, members of the Committee to have before them the possible alternative. The point at issue in cases of this kind was whether a doctor had acted in good faith and with reasonable care, and that was a question that a judge was competent to settle. He had consulted the Lord Chancellor as head of the judiciary, and his view coincided with his own—namely, that the procedure of a medical assessor ought not to be adopted. The amendment which he (Mr. Greenwood) had already indicated he would be prepared to move on the Report stage, would give substantial and adequate protection to the medical profession. Therefore if the two amendments referred to in Colonel Fremantle's speech were pressed, he must ask the Committee to reject them.

Dr. VERNON DAVIES said that some of these mental cases were extremely difficult, and means should be found to protect the doctor, not against the consequences of bad faith or carelessness, but against merely vexatious actions. The amendment which Mr. Greenwood had just handed round the Committee made the Bill a little better, but it did not go nearly so far as the amendment under discussion. The amendment of the Minister would have to be considered very carefully by legal opinion to see how far it carried out what the doctors wanted.

Dr. HASTINGS said he hoped the Minister would see his way to accept the spirit of the amendment, providing that the Court might, at its discretion, sit with one or more medical assessors. He (Dr. Hastings) had repeatedly given evidence in medico-legal cases when he had been quite certain that the judge had not appreciated at all the points which he had been trying to make. He was convinced that there was very great value in having a medical assessor sitting with the judge in difficult medico-legal cases. He

thought, however, it would be a great mistake to limit the assessors to a panel of names recommended by the President of the British Medical Association. He thought it would be a great mistake to bring that Association into the matter at all. A large number of medical men were members of the Association; on the other hand, they knew that it represented the most reactionary and commercial section of the profession. He felt very strongly that discretion should either be left to the Lord Chancellor, or if they wanted to bring in a medical body, they should bring in the scientific and not the commercial section, for instance, the President of the Royal College of Physicians.

Miss LAWRENCE (Parliamentary Secretary to the Ministry of Health) said it was impossible to accept the proposal for the nomination of a medical assessor. The whole spirit of the High Court was contrary to the idea of introducing expert assessors into the question whether a person had acted with reasonable care and good faith. She wanted to say to those who thought that they were giving too much protection to doctors in this matter that there was a real danger of frivolous and even insane complaints. Before the machinery of prosecution was set in motion there ought to be some responsible person to see if there was anything in the complaint worth sending to a jury. The Government were accepting in substance the first amendment in the name of Colonel Fremantle. They could not accept his words for a good many reasons. She suggested that Colonel Fremantle, having seen the Government amendment, which would come up on the Report stage, should now withdraw his own amendment.

Lieut.-Colonel Fremantle said he would withdraw his amendment on the understanding that it should be put on the paper for the report stage alongside the amendment of the Minister for the purposes of comparison.

The amendment was withdrawn.

Lieut.-Colonel FREMANTLE moved at the end of Subsection (1) to insert the words:—

"For the purpose of determining any question under the preceding Subsection the Court may, at its discretion, sit with one or more assessors nominated by the Lord Chancellor from a panel of names recommended by the President of the British Medical Association."

Dr. VERNON DAVIES moved as an amendment to the proposed amendment to leave out the words "from a panel of names recommended by the President of the British Medical Association."

Mr. GREENWOOD said if he were forced to accept an amendment on these lines, he would favour the amendment to the amendment, but that did not in his view destroy the case against the amendment.

The amendment to the amendment was agreed to.

The motion that "the proposed words as amended be there inserted" was negatived by 18 votes to 9.

Clause 16 as amended was added to the Bill. Clause 17 (Amendment of Section 11 of the principal Act) was also added to the Bill.

The Committee adjourned.

The Mental Treatment Bill was further considered by Standing Committee A of the House of Commons on Tuesday, April 1st. Mr. CECIL WILSON was in the chair.

Various Amendments.

On Clause 18 (Provision as to rate-aided patients) and Clause 19 (Amendment as to persons of unsound mind liable to be removed to workhouses),

Mr. GREENWOOD, Minister of Health, moved amendments providing that both clauses should come into operation immediately on the passing of the Act. He said that this was necessary for the purpose of synchronizing the operation of these clauses as far as possible with the Local Government Act which came into operation that day.

The amendments were agreed to.

On Clause 20 (Substitution of name "mental hospital" for the name "asylum," and expression "rate-aided" for expression "pauper,"

Mr. GREENWOOD moved the following amendment:—

Any provision in any local Act for the reception of voluntary boarders into any institution shall have effect as if for references therein to "voluntary boarders," there were substituted references to "voluntary patients," and any reference in this Act to persons received as voluntary patients, or as patients, under any local Act shall be construed as including a reference to persons received before the commencement of this Act as voluntary boarders under any such Act.

The amendment was agreed to.

Dr. MORRIS-JONES moved amendments to provide that after the passing of the Act the word "lunatic" as well as "pauper" should cease to be used and that the phrases "mental patient" or "person of unsound mind" should be substituted.

Mr. GREENWOOD said that there were certain administrative difficulties in the way of entirely getting rid of the term "lunatic" in an Act of Parliament, but if the Committee felt strongly on the matter he was willing to move an alternative amendment providing that the word "lunatic" should no longer be used in any Act or Order except in relation to criminal lunatics or persons detained as lunatics outside England.

Dr. MORRIS-JONES said that if the Minister assured the Committee that the term "lunatic" would only be used when it was absolutely necessary for administrative reasons he would withdraw his amendment.

Mr. GREENWOOD explained that the phrase "outside England" meant Scotland and Northern Ireland.

Dr. MORRIS-JONES's amendment was withdrawn. Mr. Greenwood then moved his alternative amendment, and this was agreed to.

Clause 20 was added to the Bill.

On Clause 21 (interpretation and adoption),

Mr. GREENWOOD moved an amendment providing a revised definition of the phrase "person in charge." This was declared to mean

"in relation to a person received or about to be received under this or any local Act as a voluntary or temporary patient (not being a person received, or about to be received, as a single patient) the medical superintendent or other person in charge of the institution, hospital, home, or place into which he was, or was about to be, so received, and in relation to a person so received, or about to be so received, as a single patient, the phrase meant the person into whose charge he was, or was about to be, so received."

The amendment was agreed to.

Mr. GREENWOOD moved an amendment deleting the sub-section extending "local authority" to include the Lancashire Mental Hospitals Board, the West Riding Mental Hospitals Board, and the Staffordshire Mental Hospitals Board. He gave an undertaking that before any rules affecting these bodies were made by the Board of Control he would take into consultation not only the hospitals boards, but the county boroughs concerned.

The amendment was agreed to and Clause 21 was added to the Bill.

Clause 22 (short title, &c.) provides that the Act shall not apply to Scotland or Northern Ireland.

Miss LAWRENCE (Parliamentary Secretary to the Ministry of Health) said that it was necessary to exclude these countries, which had different legislation.

The clause was added to the Bill.

Financial Obligations.

Some discussion took place on the financial obligations which were likely to be thrown upon local authorities as a result of this Bill, and Mr. Greenwood was pressed to give assurances that the Exchequer would give assistance to local authorities to meet those new obligations.

Mr. GREENWOOD said that the local authorities would not be precluded from coming at the end of the first block-grant period for a revision of their grant in respect of any additional expenditure thrown upon them.

Lieut.-Colonel FREMANTLE moved a new clase providing for the auditing of the accounts of licensed houses.

Mr. GREENWOOD, while accepting the principle of the new clause, said that he would prefer different wording. He suggested that the following new clause ought to meet the hon. Member's purpose:—

1. The licensee of every lincesed house shall cause such accounts to be kept as the Board of Control may prescribe. Those accounts shall be audited once a year in such manner and by such person as the Board directs.

2. A copy of the accounts and of the report of the auditor thereon shall be sent by the licensee to the Board of Control who, if they think fit, may publish them in whole or in part.

3. The licensee shall pay to the auditor such fee in respect of the audit as the Board of Control shall direct.

He said that it was intended to use the services of the official auditors for this purpose.

Lieut.-Col. FREMANTLE accepted the wording of the Minister's clause in substitution for his own and Mr. Greenwood's clause was then agreed to.

An amendment was agreed to in the First Schedule providing that a medical practitioner in filling up forms of recommendation for temporary treatment should distinguish between facts relating to the patient based on his own observation and facts communicated to him by others.

The Committee adjourned.

CARDIFF CORPORATION BILL.

On March 25th the Local Legislation Committee (Section B) of the House of Commons considered the Cardiff Corporation Bill. Mr. CAPE was in the chair.

Medical Secrecy and Cases of Cancer.

One of the Clauses of the Bill proposed to give the Corporation power to pay any medical practitioner a fee of 2*s*. 6*d*. for the notification of a case of cancer in his private practice, or 1*s*. for a case met with in public practice.

Dr. PICKEN, medical officer of health for the city of Cardiff, giving evidence in support of the clause, said that there had been in operation for some time in Cardiff a system to enable the authorities to ascertain the housing conditions and mode of life of persons suffering from cancer. That system was inaugurated on the assumption that it was authorised by an Act of 1925. It was now desired to put the matter beyond doubt as to legal authority.

In reply to Captain R. R. HENDERSON (a member of the Committee), Dr. PICKEN said the main object was to get in touch with cancer patients. One advantage would be that it would help in getting such patients into hospital in cases where early treatment was essential.

Captain HENDERSON: Will not this proposal involve a breach of confidence between a patient and his medical adviser? It seems to be a fee or bribe to a medical man to divulge the illness from which a patient is suffering.

Mr. J. H. PALIN (another member of the Committee): Surely not for half-a-crown.

Dr. PICKIN said that the clause laid no duty on a medical practitioner.

Captain HENDERSON: Have you submitted the clause to the medical authorities?

Dr. PICKIN said that the clause was the outcome of discussion by a committee consisting of experts and medical practitioners who approved the proposal.

After further discussion the Committee decided that the clause must be struck out of the Bill.

SLUM CLEARANCE BILL.

On Thursday, March 27th, Mr. GREENWOOD introduced the Housing (No. 2) Bill, a measure to make further and better provision with respect to the clearance or improvement of unhealthy areas, the repair or demolition of insanitary houses and the housing of persons of the working classes; to amend the Housing Act, 1925, the Housing, &c., Act, 1923, the Housing (Financial Provisions) Act, 1924, and the other enactments relating to housing subsidies; and for purposes connected with the matters aforesaid.

The Bill was read a first time.

PHARMACISTS IN POOR-LAW HOSPITALS.

On Monday, March 31st, on the motion for the adjournment,

Captain GUNSTON raised the question of the position of pharmacists in poor-law hospitals, as it was affected by the Draft Poor Law Order which had been published by the Ministry of Health called the Public Assistance Order, 1930. He said that the pharmacists were very much concerned about this Order, because they felt that the status of the members of their profession employed in poor-law hospitals would be very seriously jeopardised. In the voluntary hospitals pharmacists were independent officers in charge of their own department. In the Navy pharmacists were of equal rank with schoolmasters and medical officers. He urged that if this was the position in these two cases, the status ought to be given by local authorities. It was not claimed that the Minister should compel the authorities to give the same status to pharmacists, but only that authorities should be allowed to decide whether they would do so or not. They did not ask for more control, but simply that these matters should be left in the hands of the local authorities.

Miss LAWRENCE said that if that were all that was asked, she could answer in one word, Yes. This was not a new Order. It was an old Order, reissued and reprinted, and nothing more. There was no modification of substance. The only modification was the verbal one necessitated in the change in the names of the new authorities. If local authorities desired that a pharmacist should be a chief officer, they could recommend the matter to the Ministry, and discuss it with him, and even appoint him as chief officer before the Minister examined the question. The assurance was given to the local authorities by the previous Government that any amendment or modification with regard to superior officers should not be made until after consultation with the authorities. If any amendment was desired it could be made subject to consultation with the local authorities. The Ministry had changed nothing. They had not made it impossible for these people to be appointed. In these matters, as in every other, they had left the position as it was, for consultation with the new authorities.

HOUSE OF COMMONS.

WEDNESDAY, MARCH 26TH.

Medical Education for the Navy.

In reply to Dr. VERNON DAVIES,

Mr. ALEXANDER, First Lord of the Admiralty, stated that professional courses were held at the Royal Naval Medical School. The amounts included in the estimates for naval courses at Greenwich, exclusive of the Staff and War Colleges and the Medical School, for 1928, 1929 and 1930, were £78,500; £78,130; and £77,900 respectively. Vaccines used in the Navy were produced at the Medical School, Greenwich, except the anti-small-pox lymph.

Medical Officers in the Army.

Dr. VERNON DAVIES asked the Secretary of State for War if he would give for each of the last ten years for which statistics were available the total number of medical officers in the Army, the number who joined, and the number who left the service in each year.—Mr. T. SHAW gave the following table showing the total number of Regular Officers, Royal Army Medical Corps, serving in the Army by years from 1923 inclusive, together with the number who joined and the number who left the service each year.

Year.	Strength on Jan. 1st.	Joined.	Retired, resigned or died.
1923	989	11	89
1924	911	12	53
1925	870	9	47
1926	832	13	52
1927	793	25	38
1928	780	28	54
1929	754	28	32

THURSDAY, MARCH 27TH.

Report on Poisons and Pharmacy Acts.

Sir KINGSLEY WOOD asked the Home Secretary whether he could make a statement as to the Government's intentions concerning the Report of the departmental committee on the Poisons and Pharmacy Acts.—Mr. CLYNES replied: The Government recognise the importance of this report and will take it into consideration as soon as possible, but there is no prospect of their introducing the comprehensive legislation which would be required to give effect to the committee's recommendations this session.

Criminal Offences against Children.

Captain PETER MACDONALD asked the Home Secretary whether it was his intention to introduce a measure amending the Criminal Law in relation to children and young persons; and, if so, whether the Bill would be brought in during the present session of Parliament.—Mr. CLYNES replied: It is the intention of the Government, as I have stated in reply to previous questions, to introduce a Bill to amend the Children Act, 1908; but I regret that it is impossible in view of the pressure of Parliamentary business to take the Bill this session.

Street Offences.

Mr. GRAHAM WHITE asked the Home Secretary if it was the present intention of the Government to introduce legislation to give effect to the recommendations of the Street Offences Committee.—Mr. CLYNES replied: I regret I do not see my way at present to introduce legislation upon this subject.

Quality of Margarine Materials.

Mr. CHARLES WILLIAMS asked the Minister of Health if imports of oleo oil and oleo stearine used in margarine must be accompanied by a certificate that the fat was derived from animals free from disease.—Mr. GREENWOOD replied: It is not the practice at English ports to require such a certificate.

Tuberculin-tested Animals and Exhibition Order.

Mr. RAMSBOTHAM asked the Minister of Health whether he had received any protests from agricultural societies regarding the order he recently issued, prohibiting the exhibition at agricultural shows of animals from tuberculin-tested herds; and, if so, whether, in view of the hardship caused by the imposition of this order, he would reconsider the advisability of introducing it.—Mr. GREENWOOD replied: Yes, Sir, I have been informed that some of the bodies responsible for the organisation of agricultural shows are now prepared to arrange for the segregation of animals belonging to licensed tuberculin-tested herds, and I have promised to see their representatives with a view to considering the withdrawal of the prohibition in the case of shows where effective provision is made for this purpose.

Deposit Contributors and National Insurance.

Mr. THOMAS LEWIS asked the Minister of Health if he would state, for the year ending December, 1929, the number of applications received for admission to the insurance section of the deposit contributors' fund in accordance with Section 11 of the National Health Insurance Act, 1928, and the number of such applications which had been accepted and rejected, respectively, with details of the causes

of such rejection.—Mr. GREENWOOD replied: During 1929 the number of applications received for admission to the insurance section of the Deposit Contributors Fund, in England and Wales, was 12,607, of which 6176 were accepted and 6521 rejected. Figures are not available as to the number of rejections in each of the various categories, and considerable labour would be involved in extracting such information. Examination of a sample of the rejected cases shows, however, that about 90 per cent. of the applicants furnished no evidence that the state of their health was such that they were unable to obtain admission to an approved society, while the remaining 10 per cent. were found to be ineligible for admission by reason of not satisfying the qualifying conditions.

Medical Officers of Health and Vaccination.

Mr. GROVES asked the Minister of Health whether he was aware that in many parts of London pressure had been exercised by employers of labour to get their employees vaccinated and that in several instances this action had been taken at the request of the local medical officer of health; and whether, in view of the fact that the cases of smallpox notified this year were for the most part so mild that in other countries they would not be diagnosed as smallpox at all, he would issue an order requesting medical officers of health not to press vaccination as they had been doing hitherto.—Mr. GREENWOOD replied: I have no information as to the first part of the question, but I am aware that it is the practice of medical officers of health to advise the vaccination or re-vaccination of persons who have been in contact with smallpox, and it is probable that they have given this advice to employers of labour. As regards the second part of the question, I do not think that I should be justified in taking any action to interfere with the discretion of medical officers of health in this matter.

Mr. FREEMAN asked the Minister of Health whether his attention had been drawn to a circular letter sent by the medical officer of health for Bethnal Green to medical practitioners in Bethnal Green, dated March 17th, asking them when notifying cases of chicken-pox to indicate whether the patient has been vaccinated or not; whether his department has suggested the sending of such a circular; whether a similar circular had been issued by any other medical officer of health; whether he was aware that vaccinated cases of chicken-pox were automatically diagnosed as chicken-pox while unvaccinated cases of chicken-pox might be rediagnosed as small-pox; and whether he would see that cases of small-pox were diagnosed entirely on the symptoms and not on the presence or absence of vaccination marks.—Mr. GREENWOOD replied: I have seen the circular letter in question and understand that it was issued by the medical officer of health in order to facilitate his inquiries into the prevalence of small-pox in the borough. My department have not suggested the issue of such a circular, and I have no information of the extent to which other medical officers have taken the same course. The answer to the fourth part of the question is in the negative. As regards the last part, the diagnosis of small-pox, as of other diseases, is a matter for the medical practitioner in attendance and I have no authority to give any directions on the subject.

Deaths Due to Vaccination.

Mr. GROVES asked the Minister of Health how many death certificates were received during the year 1929 on which were the words vaccinations, vaccinia, or post-vaccinal encephalitis; what were the ages of those cases; and in how many other cases was vaccination associated with the cause of death without that fact being mentioned on the death certificate.—Mr. GREENWOOD replied: During the year 1929, 23 deaths were registered in England and Wales in which the words "vaccination," "vaccinia," or "post-vaccinal encephalitis" appeared in the medical or coroner's certificate. In one of these cases, however, the reference on the certificate to these conditions takes the form of a statement that they were not responsible for the death. The ages of the deceased were respectively 4 weeks, 2 months, 4 months, 5 months (4 cases), 6 months (2 cases), 7 months, 2 years, 5 years, 8 years, 9 years, 10 years, 12 years, 14 years (2 cases), 16 years, 17 years, 26 years, 31 years and 46 years. Fourteen other cases were brought to the notice of my department in which death occurred within 4 weeks of vaccination. In at least 9 of these there is no reason to think that vaccination contributed in any way to the fatal issue.

Government and Mental Deficiency.

Miss LEE asked the President of the Board of Education what action the Government proposed to take regarding the findings of the report of the Mental Deficiency Committee issued in 1929.—Sir CHARLES TREVELYAN replied: The recommendations of the report of the Mental Deficiency Committee involve important legislative changes, which will need careful consideration and affect other Government departments as well as the Board of Education. I am not yet in a position to indicate the attitude of the Government towards the report.

Children and Attendance at Cinemas.

Mr. HARRIS asked the President of the Board of Education whether he had had any reports made by the medical officer of the Board as to the effect on the child mind of constant attendance at cinemas; and, if not, whether he would cause an inquiry to be held and consult local education authorities thereon.—Sir CHARLES TREVELYAN replied: No report has been made by the Board's medical officers as to the effect on the child mind of constant attendance at cinemas. I am afraid that I cannot undertake to initiate an inquiry of this kind at the present time; but I understand that some investigations are to be made by the London local education authority, and I shall await the results with great interest.

Supply of Milk to School-children.

Dr. PHILLIPS asked the President of the Board of Education whether he was aware that recent investigations in England and Scotland had proved the great value of milk in the diet of children; and whether he could say to what extent comprehensive schemes for the supply of milk to school children were in operation in England and Wales.—Sir CHARLES TREVELYAN replied: The answer to the first part of the question is in the affirmative. With regard to the second part, I am glad to be able to say that an increasing number of children receive milk at school, either under schemes organised by the teachers through the National Milk Publicity Council, or under arrangements made by the local education authority. In Birmingham, for instance, over three and a quarter million bottles of milk were supplied to school children in 1928, representing a daily average of over 15,000 children. In Leeds more than half the school children receive milk under the exceptionally extensive arrangements made by the local education authority. I am having more detailed inquiries made.

MONDAY, MARCH 31ST.

Sickness Certificates and National Insurance.

Sir KINGSLEY WOOD asked the Minister of Health whether there had been any evidence lately brought to his notice of the laxity of certain doctors in issuing sickness certificates under the National Health Insurance Act; and whether it was proposed to issue any new regulation in connexion therewith.—Miss S. LAWRENCE (Parliamentary Secretary to the Ministry of Health) replied: This subject has been under discussion with representatives of those concerned for a considerable time, and the draft of a new regulation with respect to the issue of medical certificates for National Health Insurance purposes will be published at a very early date.

British Officers in Indian Medical Service.

Dr. VERNON DAVIES asked the Secretary of State for India the total number of British officers in the Indian Medical Service, the number who joined, and the number who left the Service in each year from 1921 to date.—Mr. WEDGWOOD BENN replied: So far as the figures can be ascertained, the following table gives (1) the total number of British Officers in the Indian Medical Service in January in each of the years stated; (2) the number who joined; and (3) the number who left the Service in each year.

Year.	1	2	3	Year.	1	2	3
1921	629	15	54	1926	506	12	29
1922	590	7	46	1926	489	15	35
1923	551	28	37	1928	469	24	35
1924	542	9	27	1929	458	25	33
1925	524	11	29	1930	450	8*	—

* To date.

Physical Defects and Rejection of Army Recruits.

Dr. HASTINGS asked the Secretary of State for War the physical and mental conditions which determined the rejection of 61 per cent. of the recruits presenting themselves for enlistment in the Army in 1929.—Mr. T. SHAW replied: The main physical defects which caused the rejection of recruits by the examining medical officers were as follows: Disease of the middle ear, loss or decay of many teeth, defects of lower extremities, defective vision, diseases of the heart, insufficient weight, flat feet, under chest measurement. I regret that information is not available to show the physical defects for which recruits were rejected by recruiting authorities other than medical officers.

TUESDAY, APRIL 1ST.

Health of the Mercantile Marine.

Mr. THOMAS LEWIS asked the President of the Board of Trade what progress had been made by the committee set up to consider and advise on any questions affecting the health of the mercantile marine; whether he could give the statistics relating to the mortality of seamen, and the hygiene of crew spaces on board ship into which the committee had been conducting an investigation since last July; and when the committee would be able to make a report.—Mr. GRAHAM replied: The work of the committee is progressing, but I cannot say when the Departments will receive the committee's views on the two subjects mentioned by my hon. friend. The existing statistics relative to the mortality of seamen are available in the annual returns of shipping casualties to and deaths on vessels registered in the United Kingdom and in Part II. of the Registrar-General's decennial supplement dealing with occupational mortality. What the committee has in hand is a detailed investigation into the question of how far and in what way those statistics can be improved. The only satisfactory method of conducting such an inquiry is in connexion with current cases, and the committee are inquiring into the deaths reported month by month from October last probably until September next. No report can therefore be expected for some months. Work on the hygiene of crew spaces on board ship is well advanced, and discussions with those concerned are proceeding.

Silicosis Order and Scottish Quarries.

Mr. DUNCAN MILLAR asked the Home Secretary what arrangements had been made to exclude Scottish quarry owners operating quarries where silicosis was unknown from the provisions of the Silicosis Order.—Mr. SHORT (Under Secretary to the Home Office) replied: Certain representations have been received but my right hon. friend is not satisfied on the evidence at present before him that there is any sandstone quarry to which the scheme applies, whether in Scotland or elsewhere, in which there is no risk of silicosis. The medical inquiry into silicosis among sandstone workers, which was arranged for by the Home Office and Mines Department in 1928, and which extended to Scotland, disclosed cases of silicosis in every area in which examinations were made and showed that quarrying was among the dangerous occupations. Fuller information will be obtained from the medical examinations which are now being made at the quarries by the medical board set up under the scheme, and my right hon. friend's intention is, when these are completed, to review the position. I may add that the sandstones at the Scottish, as at other quarries, are highly siliceous, and do not, I am advised, differ geologically from sandstones worked in other parts of the country.

Obituary.

JOHN DIXON, M.D. ST. AND., M.R.C.S. ENG., L.M.

WE regret to announce the death of Dr. John Dixon, which occurred on Monday last, March 31st, in his 98th year, at his residence in Jamaica-road, Bermondsey.

John Dixon was the son of a Yorkshire farmer, and entered Guy's Hospital in 1851 as a medical student. He graduated at the University of St. Andrews three years later, and in the same year took the M.R.C.S. Eng. He also obtained the old diploma of L.M. from the College, a qualification which has not been taken since 1873, and of which there are only some 30 holders now living—an interesting point in connexion with the fact that the Conjoint English Board are now issuing regulations for a new diploma in gynæcology and obstetrics. In 1861 Dixon became L.R.C.P. Lond., and after holding certain temporary appointments, settled down to practice in Bermondsey where he lived for 70 years. He was from the beginning of his professional life an active practitioner, taking the keenest interest in public health. He was for 40 years surgeon to the Surrey Dispensary, for a long period poor-law medical officer and public vaccinator, and for a quarter of a century medical officer of health for Bermondsey, and certifying factory surgeon. In all these capacities he earned the respect and, as years went on leaving his energies unabated, the admiration of the whole community which he served, and when in 1901 he was appointed a magistrate of the County of London, the honour was felt to have been fully earned.

For some time John Dixon must have been the senior member of every association to which he was attached. The oldest Guy's student, the oldest M.R.C.S., the oldest L.R.C.P., he was also the oldest Freemason in the country, and in the course of his career as a Mason, which commenced in 1856, he held every office and obtained every distinction which the Order affords. He was a remarkable example of one for whom old age had no terrors, and to whom it brought no disabilities. The child of parents neither of whom died until the age of 90 had been reached, his own statement was that he had practically never been ill in his life, while his freedom from illness could not be attributed to any strict rules of living, regulations of diet or restrictions of any sort, save those dictated by common sense and his medical experience. At the last dinner of the Fellows and Members of the Royal College of Surgeons of England, those seated near him were amazed to see that he dealt with the fare offered as easily as they did themselves and that he was perfectly aware of what was taking place around him, while he concluded the evening by smoking two large cigars. To all who expressed surprise at his vigour he always replied that it was due to the salubrious air of Bermondsey.

WILLIAM HOWARD NICHOLLS, M.R.C.S. ENG., L.S.A.

Dr. W. H. Nicholls, who died at his residence in Brighton on March 23rd, was in his day one of the best-known practitioners in the town. He was born in London 85 years ago, but commenced his medical studies at the Royal Sussex County Hospital, Brighton. In 1865 he entered the Guy's Hospital Medical School, where he was a prizeman, and whence he qualified in 1868 as M.R.C.S. Eng., and L.S.A. During the succeeding four or five years he resided at the Royal Sussex County Hospital as house surgeon, and in 1872 he entered into private practice in Brighton. He steadily won his way to a prominent place among his colleagues, and in 1889 was president of the Sussex Medico-Chirurgical Society. He was honorary surgeon to the Deaf and Dumb Institute and the Brighton and Hove Provident Dispensary, and at one time district medical officer to the Brighton Dispensary. Dr. Nicholls, who retired from practice nearly 30 years ago, married in 1872 Annette, daughter of the late Mr. Thomas Gates, of Shoreham, and this lady and two daughters survive him.

HENRY FAULDS, L.R.F.P.S. GLASG.

WE regret to announce the death, which occurred on March 19th last, of Dr. Henry Faulds, whose name is so well known in connexion with dactylography.

Henry Faulds, who was born in 1844, received his medical education at Anderson College, Glasgow, and was for a period a resident officer at the Royal Infirmary, Glasgow. For a time he pursued his studies at St. Thomas's Hospital, but while still a young man went to India and practised there as a civilian doctor. Later he took the appointment of surgeon-superintendent at the Tsukiji Hospital, Tokio, and for a long time was active in Japan in the cause of sanitary science. It is now 50 years since he issued a schedule containing outlines of the ten fingers to be filled in with imprints from the palmar pads of each last joint in the serial order of the fingers, and has a good claim, founded upon this work, to be regarded as the inventor of finger-print investigation. The forms, in outline, were done on copper plate in Japan while he was in charge of the Tsukiji Hospital, and were circulated freely to explorers, missionaries, ship surgeons, coroners, magistrates, judges, and chief constables. Dr. Faulds's idea was to lay the foundation of a scientific system of personal identification—he intended the records

to include soldiers and sailors, in view of the possibility of sudden death and burial without identification, to help in the recovery of lost children, to secure recognition of unknown dead bodies and of persons who had lost knowledge of their personality by illness. In 1905, Dr. Faulds published a Guide to Finger-Print Investigation, in which he emphasised his feeling that evidence of this kind can only be kept free from fallacy if submitted to the scientific expert, and the institution of finger-print collections in connexion with criminal investigation departments shows how exactly this feeling is shared to-day by highly organised communities.

Medical News.

UNIVERSITY OF LEEDS.—At recent examinations the following candidates were approved:—

M.D.

H. G. Garland (with distinction); R. Marinkovitch, and J. M. Robson.

CH.M.

L. N. Pyrah.

B.Sc.

Class II.—W. H. Tod and N. Wood (with honours in Physiology).

FINAL EXAMINATION FOR M.B., CH.B.

Part I.—J. E. Abell, P. R. Allison, E. L. Brittain, J. M. P. Clark, J. L. Coleman, J. Fielding, J. J. Fry, R. A. Hall, G. P. Holderness, J. M. Holmes, G. Hyman, A. G. James, E. A. James, G. Marquis, H. Mattison, B. S. Platt, M. R. Potter, S. Rosenbloom, M. G. Ross, N. Ross, J. Scholefield, B. Schroeder, P. Science, C. K. Shain, J. Shapiro, J. Shernovitch, and F. Staub.

Part II. (*Old regulations*).—G. Hirst and Eugenie C. Illingworth.

Part III. (*Old regulations*).—W. H. Craven, Eugenie C. Illingworth, S. Rosenberg, L. Seaton, W. E. Smart (second-class honours), and S. Thompson.

Parts II. and III (*New regulations*).—Bessie Brown (second-class honours), W. R. Everatt, J. F. Galpine, and R. G. S. Meadley.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PYHSICIANS AND SURGEONS OF GLASGOW.—The following candidates for the triple qualification have been approved:—

A. A. Hamilton, Shyam Sundar Misra, C. W. Clayson, Hari Chand Mehta, W. A. McE. Stewart, J. L. Chisholm, and D. A. Fraser.

DIPLOMA IN PUBLIC HEALTH.

Part I.—G. H. H. Maxwell, W. D. Bertram, E. L. Godfrey, R. H. Dawson, Margaret B. MacLaren, Dorothy D. W. Brander, Anna M. M. Kerr, Thaliakattu Parukutti Ammal, Winnifred N. Henderson, Jessie, E. M. Munro, J. A. Burgess, and A. D. Gorman.

UNIVERSITY OF ABERDEEN.—At a Graduation Ceremony, held on March 26th, the following degrees were conferred:—

M.D.—*John Charles Kerrin, †Thomas Edge Anderson, †George Carmichael Kelly (*in absentia*); ‡Robert Gordon Spink (*in absentia*), Harry Emslie Smith.

* Awarded highest honours for thesis. † Awarded honours for thesis. ‡Awarded commendation for thesis.

M.B. and Ch.B.—*Edwin James Reid Leiper (with first-class honours); *William Ian Andrew Fell, *John Gerrie, and Howard Bruce Wilson (with second-class honours). Ordinary Degree: Robert Mackay Barron, Edward Farquharson, Herbert Fowlie, William Frederick Gapper, Herbert John Green, Marshall William Keith, John Grant Lindsay, Ronald Maclean, Duncan Campbell Robb, John Marshall Ross, and George Alexander Sharp.

* Completed Final Medical Professional Examination with distinction.

UNIVERSITY OF DURHAM.—At recent examinations the following candidates were successful in the undermentioned subjects:—

LICENCE IN DENTAL SURGERY: THIRD EXAMINATION.

Pathology and Bacteriology, Practical Dental Mechanics, Dental Materia Medica and Therapeutics.—J. A. Atkinson, and T. A. Ireland.

THIRD EXAMINATION FOR M.B., B.S.

Pathology and Bacteriology, Materia Medica, Pharmacology, and Pharmacy; Public Health; Medical Jurisprudence.—*A. de W. Ranken, *H. K. Vernon, *J. I. M. Black, *C. F. Down, *A. R. Holtby, and *W. P. Dunn. Pass-list: H. Bannerman, T. H. Boon, Gladys M. Brice, J. L. Burn, R. D. Burn, G. S. Clark-Maxwell, J. A. Forrest, J. W. Gibson, John Giles, T. R. Harlan, H. F. Harvey, N. V. Hepple, J. R. Hindmarsh, T. M. John, A. D. Kelly, J. J. H. Lowe, Elizabeth S. Malcolm, J. A. McKeon, J. C. Moor, E. W. Peet, Prem Nath Rampal, J. D. Rose, L. R. Routledge, Kathleen Rowstron, J. K. Stanger, F. H. Taylor, with second-class honours.

UNIVERSITY OF LONDON.—The University College Committee have re-elected Viscount Chelmsford as chairman, and Sir John Rose Bradford as vice-chairman for the year 1930-31.

NAVAL MEDICAL COMPASSIONATE FUND.—A meeting of the subscribers of this Fund will be held at 3.30 P.M. on April 24th at the Medical Department of the Navy, Queen Anne's Chambers, Tothill-street, Westminster, London, S.W., to elect six directors of the Fund.

HARVEIAN SOCIETY.—A meeting will be held at the Paddington Town Hall on Thursday, April 10th, at 8.30 P.M., when a discussion on High Blood Pressure will be opened by Sir Thomas Horder, followed by Dr. Batty Shaw and others.

ROYAL NORTHERN GROUP OF HOSPITALS.—A post-graduate course will be held at the Royal Northern Hospital, Holloway-road, N., and the Royal Chest Hospital, City-road, from April 7th to 11th. Particulars will be found in our Medical Diary.

DIPLOMA IN PUBLIC HEALTH.—A three months' course of lectures and demonstrations on clinical practice and hospital administration will be given at the North-Eastern Hospital, St. Ann's-road, Tottenham, London, N. 15, by Dr. F. H. Thomson, on Mondays and Wednesdays at 4.45 P.M., and on alternate Saturdays at 11 A.M., beginning on Wednesday, April 9th.

ROYAL SANITARY INSTITUTE.—A sessional meeting will be held on April 11th, in the Town Hall, Chatham, when a discussion on the Administrative Control of Infectious Disease will be opened by Dr. W. A. Muir. Discussions will also take place on Modern Elementary School Construction, and on Special Difficulties in Housing. On April 12th visits will be paid to the Rochester and Chatham Joint Sewage Works; The Royal Naval Hospital; and to a Certified Milk Farm and Pasteurisation Plant.

ELIZABETH GARRETT ANDERSON HOSPITAL.—Twenty pay-beds are being installed at a cost of £20,000. The hospital has grown from 20 beds in 1882 to 105 beds, and patients have multiplied seven and a half times in that period. Sir Alan Anderson last week unveiled a window in the Pollock Ward in tribute to the 40 years' work of Mrs. Gordon Pollock, who recently resigned the chairmanship.

KING'S COLLEGE HOSPITAL.—In 1929 the number of patients was the highest since the end of the war, constituting the largest daily average of civilian patients in the history of the hospital. The daily average, excluding babies born in the maternity ward, was 329; the total number of in-patients just exceeded 7000, an increase of 746 over the preceding year. The new asthma clinic is being well attended.

LIVERPOOL POST-GRADUATE COURSE IN CARDIOLOGY.—A special two weeks course in cardiology will be held at the Liverpool and District Hospital for Diseases of the Heart, Oxford-street, Liverpool, from April 29th to May 12th. Lectures and demonstrations will be given between 3.30 and 5.30 P.M. in the afternoons by Dr. I. Harris, Dr. Newman, Mr. P. W. Leathart, Dr. I. J. Lipkin, Dr. C. Rankin, and Dr. F. S. Hawks. On April 29th and 30th, at 4.30 P.M., Prof. J. M. Beattie will lecture on the Bacteriology of Rheumatic Infections and on Vaccines and Antitoxins at the University School of Hygiene, Oxford-street. The clinics at the hospital will be open to those taking part in the course, who will not exceed 20. Early application should be made to the secretary at the hospital.

POST-GRADUATE COURSE IN INFANTS' DISEASES.—A special course in infants' diseases for medical officers of welfare centres and others will be given at the Infants Hospital, Vincent-square, Westminster, from April 28th to May 11th, under the auspices of the Fellowship of Medicine. Lectures and demonstrations will be given every afternoon by Dr. W. E. Robinson, Dr. Vincent Denne, Dr. Eric Pritchard, Dr. Jean Smith, Dr. N. O. Richards, Dr. A. Maitland Jones, Dr. C. C. Okell, Dr. Muriel Radford, Mr. Tyrrell Gray, Dr. B. Shires, Mr. Philip Franklin, and Mr. David Levi. On Saturday visits will be paid to United Dairies Pasteurising Plant, Willesden, and the Nursery Training School, Welgarth-road, Hampstead, and on Sunday to the V.D. Centre for Prophylactic Treatment of Syphilis in Infants at Thavies Inn, Holborn. The number of practitioners attending the course is limited to 15. Applications should be sent to the secretary of the Fellowship at No. 1, Wimpole-street, London, W. 1.

THE TEACHING OF RADIUM THERAPY.

THE MOUNT VERNON AND RADIUM INSTITUTE.

THE Radium Commission announces that facilities for post-graduate teaching in radium therapy will be provided at the Radium Institute and the Mount Vernon Hospital (Northwood), which institutions are being reorganised as a joint teaching centre, styled the "Mount Vernon and Radium Institute," under a single control so far as medical services, teaching, and research are concerned. In all other respects the two institutions will retain their separate identities.

Allocation of Radium.—So far 17 grammes (out of a possible total of about 22) have been ordered and provisionally allocated by the Commission. Nine grammes have already been received from the manufacturers, and 6¼ of these have been delivered to centres in England, Scotland, and Wales.

National Radium Centres.—In accordance with the policy of concentrating national radium at a limited number of centres with medical schools attached, 12 "national radium centres" have been nominated. Of these, Birmingham, Cardiff, Edinburgh, and Aberdeen have already been supplied with radium; Manchester, Glasgow, and Newcastle will receive a supply almost immediately; while the agreements with Bristol, Dundee, Leeds, Liverpool, and Sheffield have yet to be signed. Plants for the preparation of radon (radium emanation) are being set up in some centres. In London two centres are being organised to carry out special work: (1) the Mount Vernon and Radium Institute, mentioned above; and (2) the Westminster Hospital, which is experimenting with a "bomb" (containing 4 g.) in order to determine the value of mass irradiation and long distance radium therapy.

Radium National Forms.—A set of "radium national forms" for the use of recognised centres have been prepared in order that the clinical records of all cases treated may be kept on a uniform basis and eventually incorporated in general national statistics. It is hoped that these may eventually be adopted by other institutions practising radium therapy. Specimen copies may be obtained on application to the Secretary of the Commission at 5, Adelphi-terrace, London, W.C. 2.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, April 8th.—8.30 P.M., PSYCHIATRY. Dr. Edward Mapother and Dr. A. A. W. Petrie: Impressions of American Psychiatry.
THURSDAY.—5 P.M., DISEASE IN CHILDREN. (Cases at 4.30 P.M.) 8.30 P.M., NEUROLOGY. (Cases at 7.45 P.M.) Clinical Meeting at the Hospital for the Paralysed and Epileptic, Maida Vale, London, W.
FRIDAY.—5.30 P.M., CLINICAL. (Cases at 4.30 P.M.) Cases. Mr. Harold Edwards: Abnormal Ossification of the Patella with Symptoms? due to Osteochondritis. Spontaneous Rupture of the Biceps Humeri in a Tabetic Patient. Mr. A. E. Mortimer Woolf: Fracture of the Humerus with Intra-articular Dislocation—Operation, Replacement. Mr. Paul Bernard Roth: Double Coxa Vara. Dr. H. V. Morlock: Case of Hæmochromatosis. Mr. Cecil P. G. Wakeley: Painful Traumatic Osteo-arthritis. Case of Eighth Nerve Tumour after Operation. Case of Lymphadenoma. Dr. M. A. Blandy: Case of Leontiasis Ossea. Other cases will be shown. 8 P.M., ELECTRO-THERAPEUTICS. Dr. H. A. Bulman, Dr. L. H. Clark, Dr. S. Russ, and Dr. Samson Wright: The Physiological Effects of Penetrating X Rays upon the Cat and Rabbit. A discussion will follow.

MEDICAL SOCIETY FOR THE STUDY OF INDIVIDUAL PSYCHOLOGY, 55, Gower-street, London, W.C.
THURSDAY, April 10th.—8.30 P.M., Dr. Crookshank: Illustrations of I.P. from the Penny Papers.

HARVEIAN SOCIETY, Paddington Town Hall, W.
THURSDAY, April 10th.—8.30 P.M., Discussion on High Blood Pressure, to be opened by Sir Thomas Horder, followed by Dr. Batty Shaw, and others.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Upper Montague-street, W.C.
FRIDAY, April 11th.—5 P.M., Dr. W. M. Ash, Dr. Reginald Worth and Dr. W. A. Potts: Mental Deficiency and Lunacy in Relation to Public Health.

CHILD-STUDY SOCIETY, 90, Buckingham Palace-road, S.W.
THURSDAY, April 10th.—6 P.M., Dr. R. H. Crowley: Parent Education, the Home and the School.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, April 7th, to SATURDAY, April 12th.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Special post-graduate course in Medicine, Surgery, and Gynæcology. Operations and lecture-demonstrations in the Wards and Out-patient Departments.—WEST END HOSPITAL FOR NERVOUS DISEASES, 73, Welbeck-street, W.1. Special post-graduate course of lectures and clinical demonstrations. Daily at 5 P.M.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, April 7th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose, and Throat Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat, and Ear Clinics. Operations.
FRIDAY.—10.30 A.M.: Throat, Nose, and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases. Clinics. Operations.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
MONDAY, April 7th.—2.15 P.M., Mr. L. E. Barrington-Ward: Demonstration of Surgical Cases. 3.15 P.M., Mr. C. Lane Roberts: Difficult Forceps Cases.
TUESDAY.—2.15 P.M., Mr. Kenneth Walker: Coliform Infection of the Urinary Tract. 3.15 P.M., Teaching in the Wards.
WEDNESDAY.—2.15 P.M., Dr. Bernard Schlesinger: Demonstration of Cases in the Children's Depts. 3.15 P.M., Dr. H. C. Semon: Clinical Demonstrations.
THURSDAY.—2.15 P.M., Dr. E. G. B. Calvert: Abdominal Pain. 3.15 P.M., Mr. J. B. Hunter: Tumours of the Breast.
FRIDAY.—2.15 P.M., Dr. Bruce Williamson: Medical Ward Visits. 3.15 P.M., Teaching in the Wards.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE, Keppel-street, W.C.
TUESDAY, April 8th.—4 P.M., Sir Andrew Balfour will give an address describing Prof. W. H. Welch's life and work in celebration of his eightieth birthday. Admission free.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL.
FRIDAY, April 11th.—4 P.M., Mr. W. A. Mill: Earache in the Normal Ear.

ROYAL DENTAL HOSPITAL OF LONDON, Leicester-square.
WEDNESDAY, April 9th.—6 P.M., Mr. F. Talbot: Trigeminal Neuralgia as it Occurs in the Electro-therapeutic Department.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.
TUESDAY, April 8th.—5 P.M., Mr. W. McKim McCullagh: The Treatment of Obstructed Labour.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
TUESDAY, April 8th.—4.15 P.M., Mr. E. W. Telford: Fractures of the Ankle-joint.
FRIDAY.—4.15 P.M., Mr. W. H. Hey: Demonstration of Surgical Cases.

ANCOATS HOSPITAL, Mill-street, Manchester.
The Lecture on Affections of the Kidney, postponed from April 3rd to April 10th, will not be given until a later date. There will not be a lecture on April 10th.

ANCOATS HOSPITAL POST-GRADUATE COURSE, Mill-street, Manchester.
THURSDAY, April 10th.—4.15 P.M., Mr. Harry Platt: Injuries of the Spine.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, April 9th.—4.15 P.M. (at the Ophthalmic Institution), Dr. H. Wright Thomson: Eye Cases.

Appointments.

ADAMSON, A. F., M.B., Ch.B. Edin., D.P.H., has been appointed Medical Officer of Health and School Medical Officer for Hendon.
AHERN, J. M., M.B., B.Ch.R.U.I., Medical Officer at Parkhurst, Isle of Wight.
CLARKE, JOSEPHINE, M.B., B.Ch.N.U.I., Medical Officer for Arranmore Dispensary District.
COX, GLADYS M., M.B., B.S. Lond., Medical Officer for Clinics at Armada-street Centre, Greenwich.
CRAWFORD, MABEL, M.D., B.Ch. Dub., Hon. Asst. Surg., Liverpool Maternity Hospital.
FARRELL, MARY, M.B. Ch.B. N.U.I., Medical Officer for Longford.
KREMER, M., L.R.C.P. Lond., M.R.C.S., House Physician, Middlesex Hospital.
LOGAN, F. C., M.B., Ch.B. Glasg., Medical Superintendent of the Gloucester County and City Mental Hospitals.
MORLEY, J., M.B., Ch.M. Manch., F.R.C.S. Eng., Lecturer in Systematic Surgery in the University of Liverpool.
SIMPSON, G. S., F.R.C.S. Eng., Professor of Surgery in the University of Sheffield.

Vacancies.

For further information refer to the advertisement columns.

Aberdeen Royal Hospital for Sick Children.—Two H.P.'s. and two H.S.'s.
Aden Settlement, Arabia.—M.O.H. 800Rs. per mensem.
Barnsley, Beckett Hospital.—Cas. O. £250.
Barrow-in-Furness, North Lonsdale Hospital.—H.S. £175.
Bath, Royal United Hospital.—H.S. Asst. H.S. At rate of £150 and £100 respectively. Also H.P. £120.
Bedford County Hospital.—H.S. At rate of £175.
Beit Memorial Fellowship for Medical Research.—Jun. Fellows. £400.
Birmingham, Queen's Hospital.—Two H.P.'s. Res. Anæsthetist. Also Cas. H.S. All at rate of £70.
Blackburn Royal Infirmary.—Fourth H.S. £150-£200. H.S. At rate of £100.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. At rate of £120.
Bristol Royal Infirmary.—H.P. At rate of £60.
Burnley, Victoria Hospital.—H.P. At rate of £150.
Burton-on-Trent General Infirmary.—H.S. £150.
Cambridge, Addenbrooke's Hospital.—H.P. and H.S. Each at rate of £130.
Connaught Hospital, Orford-road, E.—Sen. Res. H.S. At rate of £150. Also Jun. Res. H.S. At rate of £100.
Derby, Derbyshire, Royal Infirmary.—H.P. £150.
Doncaster Royal Infirmary.—Hon. Phys. and Path. Hon. Ear, Nose and Throat S. Also Two Hon. Anæsthetists.
Downpatrick, Down Mental Hospital.—Jun. Asst. M.O. £300.
Dundee Royal Infirmary.—Two Asst. Visiting M.O.'s
Durham County Council.—Asst. M.O. for Public Services. £800.
Durham County Hospital.—Jun. H.S. £120.
East Ham Memorial Hospital, Shrewsbury-road, E.—H.P. and Cas. O. At rate of £150.
Edinburgh Corporation.—M.O.H. £1500.
Evelina Hosp. for Children, Southwark, S.E.—H.S. At rate of £150.
Folkestone Borough.—Asst. M.O.H. £600.
Halifax Royal Infirmary.—First H.S. also Third H.S. At rate of £175 and £100 respectively.
Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—H.S. At rate of £100.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. £50 for six months. Jun. H.P. At rate of £100.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. and H.P. At rate of £150 and £100 respectively.
Hospital for Women, Soho-square, W.—Res. M.O. At rate of £100.
Hove, Lady Chichester Hospital.—Jun. H.P. £50.
Huddersfield County Borough.—Asst. M.O.H. £500.
Inverness, Northern Infirmary.—H.P. £100.
Indian Medical Service.—Commissions.
Kenya Colony.—Medical Officer.
King Edward Memorial Hospital, Ealing, W.—Sen. and Jun. H.S.'s. At rate of £150 and £100 respectively.
Lincoln County Hospital.—Jun. H.S. At rate of £150.
Liverpool, St. Paul's Eye Hospital.—H.S. At rate of £120.
London Homœopathic Hospital, Great Ormond-street, and Queen-square, Bloomsbury, W.C.—Res. M.O. £100.
London Jewish Hospital, Stepney Green, E.—Med. Reg. and Out-patient Asst. At rate of £150.
Manchester Ear Hospital, Grosvenor-square, All Saints.—H.S. At rate of £150.
Medical Inspectors of Factories.—£600.
Metropolitan Hospital, Kingsland-road, E.—Sen. H.P., Sen. H.S., Jun. H.P., Jun. H.S. Also Two Cas. O.'s. All at rate of £100.
Montrose Royal Asylum.—Asst. M.O. £225.
Newcastle-upon-Tyne, Hospital for Sick Children.—Jun. H.S. Also Res. Sen. H.S. At rate of £100 and £95 respectively.
Nottingham General Hospital.—Second Cas. O. At rate of £150.
Preston and County of Lancaster Royal Infirmary.—Pathologist. £1000.
Princess Louise Kensington Hospital for Children, North Kensington.—H.P. At rate of £75.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Res. Anæsthetist. At rate of £80.
Queen's Hospital for Children, Hackney-road, E.—H.S At rate of £100.
Royal Eye Hospital, St. George's Circus, Southwark, S.E.—H.S. Also Asst. H.S. At rate of £150 and £100 respectively.
Royal Free Hospital, Gray's Inn-road, W.C.—Cas. O. At rate of £150. Also Res. Anæsthetist.
Royal Northern Hospital, Holloway-road, N.—Pathologist. £750. Also Asst. Pathologist. £500.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.S. At rate of £100.
St. Bartholomew's Hospital, E.C.—Chief Asst. to Dental Dept., also Dental H.S. At rate of £80.
St. Helen's Hospital, Lancashire.—Res. M.O. £250.
St. John's Hosp., Lewisham, S.E.—Res. Cas. O. At rate of £100.
Salford Royal Hospital.—H.P. also Cas. H.S. Each at a rate of £125.
Samaritan Free Hospital for Women, Marylebone-road, N.—H.S. At rate of £100.
Southampton, Royal South Hants and Southampton Hospital.—Cas. O. At rate of £130-£160.
Stafford County Mental Hospital.—2nd Asst. M.O. £600.
Stockport Infirmary.—H.P. £175.
Tiverton Hospital.—H.S. At rate of £100.
Wakefield, Clayton Hospital.—Two H.S.'s. Each at rate of £150.
Walsall General Hospital.—Cas. H.S. At rate of £150.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. Res. H.S. Also Jun. H.S. At rate of £150 and £100 respectively.
Winchester, Royal Hampshire County Hospital.—Hon. Anæsthetist.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Soham (Cambridgeshire).

Notes, Comments, and Abstracts.

SOME PSYCHOLOGICAL OBSERVATIONS ON ADULT MALE TUBERCULOUS PATIENTS.

By H. Banister, M.Sc., Ph.D. Camb.,

LECTURER IN EXPERIMENTAL PSYCHOLOGY, UNIVERSITY OF CAMBRIDGE; AND HON. PSYCHOLOGIST, PAPWORTH VILLAGE SETTLEMENT.

For the understanding of the mental outlook of patients suffering from tuberculosis it is necessary that the salient facts of the disease itself should be known.

Underlying Pathology of the Disease.

Tuberculosis, which is essentially a disease of civilisation appears in two main forms. The forms are not mutually exclusive, but merge into each other. The first type is an acute generalised tuberculosis in which the lungs are affected as a part of the general infection. This is the most severe type, and is the form the disease generally takes when introduced into uncivilised lands. It is the form most prevalent in infancy, and is responsible for about one out of every three infantile deaths. If an infant which has been infected survives, the result is a certain amount of immunity; so that, between infancy and puberty, children are particularly free from tuberculosis. But at puberty there is a sudden increase in the death-rate. The disease is now of the second type, which consists most commonly of chronic pulmonary lesion, often without any tuberculosis anywhere else. The death-rate falls gradually as the sex life wanes. As a rule, proneness to the disease begins earlier and subsides earlier in women than in men. These facts may possibly be of significance.

One other point, and a most important one for us, is that, in general, the disease is painless. There is actual destruction of the tissue—e.g., of the lung—and a general toxæmia; but except in special cases—e.g., in pleurisy—there is no pain and little active discomfort. The patient feels disinclined to exert himself, and may complain of a general slackness. Otherwise there is little to indicate to him the seriousness of the malady with which he is attacked. From the nature of the disease it is obviously very difficult—at present it is impossible—to effect a "cure." The utmost that can be done is to arrest the progress of the disease; but the loss of tissue remains and the infection is always there and may at any time break out anew. As R. C. Wingfield [1] says, "No patient can be said to be cured till he is safely dead of some other disease." As an example of this I may give the case of a patient at Papworth. The disease was arrested, and he was working, was well, and was happy. He was also very keen on the stage, and was very anxious to see Mrs. Patrick Campbell in "Magda." Contrary to medical advice he went, was very thrilled by the play, and . . . died within the week.

Mental Consequences.

So much for the pathology of the disease. What of the mental consequences? These are many and widespread, though whether there is any definite insanity which is to be connected with tuberculosis is open to doubt. S. A. Knopf [2] considers that there is no definite pathological outlook which is connected with tuberculosis. D. G. M. Munro,[3] on the other hand, considers that there is a phthisical insanity—an example of an exaggeration of ego-centricity—and that the symptoms may be regarded "as generally falling within two main groups: (*a*) mania of a mild delusional kind, and (*b*) melancholia." T. S. Clouston [4] also points out that the death-rate from pulmonary tuberculosis in the Royal Edinburgh Asylum, during the decade 1879–88, was higher than that in the general population as 3 : 1, and suggests that the reason why so few cases of insanity occur in sanatoria is that the mental symptoms declare themselves first. The connexion between dementia præcox and tuberculosis is commented on by Dr. Pollock, of the Department of Mental Hygiene, New York, in a private letter to me as follows: "The question of the relation of dementia præcox to tuberculosis has been raised on account of the high rates of death of dementia præcox patients from tuberculosis. It seems probable, however, that such high

[1] Text-book of Pulmonary Tuberculosis, p. 4.
[2] Military Surgeon, vol. lvi., 1925 (quoted from Munro, The Psychopathology of Tuberculosis).
[3] Psychopathology of Tuberculosis, pp. 25–31.
[4] Dictionary of Psychological Medicine, vol. ii., p. 939.

death-rates are due to the habits of the dementia præcox patients and not to any close relationship of the physical to the mental disorder." From my own very slight experience, I am inclined to the view expressed by Dr. Pollock—viz., that the tuberculosis is a consequence of, and not a cause of the insanity.

Yet the average sufferer from tuberculosis is far from normal. This, I think, must be ascribed to many factors, of which the toxæmia may be one, in that it entails a general lowering of vitality, thus decreasing the resistance which the patient can offer to any disturbing influence. He is, in consequence, much less able to solve his problems and is, therefore, much more liable to a breakdown should any difficulty arise in his life. And with such difficulties the life of the victim of tuberculosis is fraught, and as a result we get many abnormal symptoms, which are not produced by the disease directly, but which are caused by the difficulty of living. In my opinion such mental symptoms may be expected to occur in any disease or illness which is painless and long, and which involves the individual in difficult problems.

As has already been indicated the disease has usually a long history before diagnosis, and hundreds, nay thousands, of apparently healthy people are in reality already far gone in tuberculosis. They are not, perhaps, the most advanced of them, feeling very fit. They have coughs and colds, but they will "be all right in a day or two," and so they carry on, sometimes better, and sometimes worse, putting off the evil day when they must call in the doctor. It is a strange fact that a medical examination should be regarded with such terror, unless one is really ill. Who, even the fittest of us, does not know the feeling of relief when our medical examination, say for an assurance policy, is over? And so the individual carries on, a little more weary, perhaps, a little more irritable with his people at home, and his friends possibly thinking him rather a slacker; or, if cast in another mould, he carries on in spite of his feeling of lassitude, priding himself on the fact that he so seldom misses a day's work. Then one day he is examined, either going of his own freewill, or being forced to call on the doctor owing to a hæmorrhage. Of these two cases, the latter is the easier one to treat. The patient and his family have had a rude shock. They are all thoroughly frightened. Something must be done and that quickly; so, though the effect of the hæmorrhage may be physically slight, treatment is undertaken at once, and there is hope. The one who has not had such an experience goes on hoping and perhaps persuading himself that the diagnosis is not correct. He is in consequence much less likely to follow out the treatment which is necessary.

Reaction when Diagnosis is Made.

The reaction of patients when the diagnosis is made is very variable. The patient may take it calmly, obviously realising the verdict and all its implications; or he may break down completely—a big, strong-looking fellow bursting into a flood of tears; or the serious statement may be received with indifference, the patient acting as though the diagnosis were of no account or at least as though he believed the doctor had made a mistake. These reactions are, I consider, valuable to the doctor, and should be carefully noted. They show the attitude the patient is adopting towards his illness, and this attitude is important for his future welfare. The one who faces the facts calmly with full realisation is already beginning the struggle bravely, a great factor in his favour; the one who breaks down may be comforted, and after the first shock may also put up a brave fight; but the third has already decided to throw in his hand. He dare not face the situation, and will do all manner of foolhardy things to prove that the diagnosis is incorrect, often with disastrous results. Such an one requires careful attention. It is not sufficient to send him away from the consulting-room muttering under one's breath that one can do nothing for fools. One can do nothing with fools, but one can endeavour to prevent them from being fools. Half an hour spent by the doctor at such a time will save many a weary hour later.

It is hard for us who are fit and well to realise what a blow the diagnosis of tuberculosis may be. A man, often with a wife and family and a comfortable home, with a business which is secure and which is steadily growing, and with a future which seems so assured—a man to whom the world appears a lovely place with its bright spots far outnumbering the few clouds which serve but as a contrast to what is so pleasant—such an one is told he has tuberculosis. Gone is his future; no more can he compete in his business; the holiday he had so joyously planned may not be; his children's education must now be modified; the house must be sold; his wife must go out and work. Not only is he himself no longer a breadwinner, he is instead bound to be a heavy and constant expense through the long and wearisome illness, which can end in but one way. It is a brave man who can face such a situation unafraid. But the state is even worse than this, for the man is no longer able to mix freely with his fellow men. His friends are chary of asking him to their houses for fear lest he should infect them or their children; if he coughs all eyes turn in his direction. He is now an outcast. This is a terrible experience, and the patient plumbs the depths. Is it surprising that he gives way to despair?

Result of Individual Sentiment.

The best patients are those who will face the facts; but most, even of them, go through a period of great depression, and are very liable to break down. The most satisfactory patients are often, in my opinion, the married. This may seem strange, for they have others dependent on them and their worries accordingly, one would think, must be greater than the worries of those who are not "hampered" with a wife and family. This is quite true in one sense; but there is another factor, which is that the married man often has a strong sentiment organised round his family, and for their sakes he "will" get well. The unmarried man, all too often, has as his chief sentiment a peculiarly self-centred one. He is ambitious; he would have been such a good boxer or footballer, or something of that kind. He now has nothing to live for. What is the use? He can no longer go about and have a good time again, and—down he goes. Here, I think, we touch on a very vital problem in the study of tuberculosis. It is the organisation of the individual's sentiments which is of prime importance—a man with his principal sentiments organised round some ideal, which is not ego-centric, is able to bear the disorganisation caused by the disease, and to reorganise his life as may be necessary; the other, whose chief sentiment is ambition, or other self-centred sentiment, loses morale at once. He tends to go off into day-dreams of what might have been, or of what may still be if he is only cured quickly. He rails against his misfortune. Why is it that he is so much more hardly dealt with than are others? He is for ever looking at his thermometer and watching his symptoms; the least little thing puts him back, and he becomes a valetudinarian, and rapidly acquires the sanatorium habit, going round from one sanatorium to the next, ever more depressed, and going steadily down with little respites at every new sanatorium. Such patients are very difficult to treat. They cannot reorganise their lives.

At the same time, the general lowering of vitality, the result largely of the toxæmia, exacerbates any weakness already present. The many conflicts, which every individual has to face, and with which the majority of normally healthy individuals can cope satisfactorily, are beyond their strength, and the patient worries and worries, and loses his sleep. Rest is one of the main planks in the treatment, but lying in bed doing nothing but worry is not resting. Rest, lying down doing nothing, is the one thing such a patient cannot do. He cannot rest. He is filled with a feverish restlessness which is so often apparent and which is so very harmful. He becomes peevish and irritable, and a great trial to his nurse. Wingfield [5] remarks over and over again on the importance of searching for these worries, which he says, "may seem trivial, but . . . are really all-important." This is true; but the secret of treatment is not in the prescription of pot. bromide. Such treatment is, in my opinion, fundamentally wrong, and would be perhaps as useful as giving a man bromide for a broken arm. Nor is the secret of treatment to be found in work, assuming the patient is physically fit to work, which so often is not the case, for it is not occupation which is wanted; the mind is already more than fully occupied with its worries. The value of work is not to be decried. Its value is enormous, when organised as it is at Papworth, for the simple reason that it is the solution of the majority of the worries, not because it gives the patient something to think about. The patient sees that he can still work and earn a decent living, though in a different manner perhaps than when he was well. But work is not sufficient in these cases. No! The difficulties and worries must first be gone into and straightened out if progress is to be made. There was one such at Papworth in October last. He came to Papworth after four years' treatment elsewhere, during almost the whole of which time he had been given bromides because he never slept on account of his worries. Three-quarters of an hour on two separate days solved his difficulties. He began immediately to sleep well, and has had no relapse since.

Neurosis and the Spes Phthisica.

Sometimes patients may develop serious neuroses. Their treatment, psychologically, must follow the usual lines, but it is always to be considered whether the patient's state physically is such as to warrant proceeding further with such treatment.

We now come to that extraordinary state of hopefulness into which so many patients fall before the end; a pathetic state in which the patient, with scarcely strength to move

[5] Loc. cit., p. 122.

and within a few hours of his death, will talk cheerfully of what he is going to do when he is better. This state, the so-called spes phthisica, has been often described. But it must on no account be confounded with the state of resolution and hope with which, as I have mentioned earlier, some patients, particularly those whose mental life is healthily organised, face their trouble. This latter attitude is one to be encouraged; but the hope of the spes phthisica is far different. It does not make for recovery. It is almost tantamount to saying the patient has given up the struggle, and is of bad prognostic significance. And yet it should not be discouraged, for it does help the patient through his last days.

As I see it, the spes phthisica is a dissociation, the final stage in a long struggle, the initial one being, perhaps, evidenced in the man who refuses to acknowledge the diagnosis. The diagnosis and all it entails is so terrible that the individual cannot face the fact. It is pushed away more or less completely, and more and more completely as the disease progresses more and more. A number of patients, when in the middle stage, have described the "peculiar experience" of feeling that it is not they who are lying ill. They realise that they really are on the bed, and yet it does not seem to be them. They can adopt quite an objective attitude towards the rise and fall in their temperature, and towards their night sweats. Such things do not worry them in the least! . . . These are all stages, to my mind, in the dissociation which is so remarkable in its final form. In this interpretation of the phenomena, which I believe to be correct, I differ entirely from all the authorities I know on tuberculosis; but these authorities are, as a rule, authorities on the physical side only of the disease.

Summary.

1. Tuberculosis is a painless and long drawn-out illness.
2. There do not appear to be any specific psychoses or psychoneuroses connected with tuberculosis as a direct consequence of the disease. The abnormalities which arise, and they are many, are expressions of maladjustment such as may occur in any non-tuberculous individual.
3. The shock incident on diagnosis is great, and produces various anxieties and worries, not the least being the feeling that one is henceforth a pariah and an outcast.
4. The attitude the patient adopts towards his disease has a great effect on his progress. This attitude depends to no small extent on his sentiments, and on the way in which his sentiments are organised—the more ideal and the less self-centred the object of the sentiment the better.
5. Spes phthisica is a form of dissociation. In its initial stage it may be evidenced by a refusal to accept diagnosis; later the patient takes an objective view of his diseased body which seems to be something apart from himself; finally he is convinced he will soon be out and about again, the fact of his imminent death being absolutely dissociated. Prognosis in all these cases is probably bad.

NATIONAL COUNCIL FOR MENTAL HYGIENE.

THE statutory annual general meeting of this Council was held on March 21st to receive the report for 1928–29. As the chairman, Sir Maurice Craig, remarked, the work has been steadily constructive rather than spectacular. Two successful series of lectures have been held and it is hoped that an educational series can be arranged for each spring and autumn. Although not strictly falling within the 12 months under review, reference was made to the remarkably successful conference held at the Central Hall, Westminster, last October (THE LANCET, 1929, ii., 998), and also to the international congress which is to be held in Washington next May. The full report of the London conference is now on sale (2s.) and a bulletin report of the Washington conference will be published as soon as possible. Propaganda work advances steadily; many drawing-room meetings have been addressed by members of the committee, and the Council hopes to organise a provincial campaign this summer. The subcommittee on the prevention and early treatment of mental disorders had done enough work to put it in a position to act promptly when the Mental Treatment Bill was rather unexpectedly introduced into the House of Commons this session. Many of the suggestions made by the committee have been incorporated in the Bill. This subcommittee has also circularised local authorities setting out the need for improved facilities for the treatment of poor persons suffering from minor mental disorders. The circular has been sympathetically received, and the Council propose to follow it up by sending an expert to discuss ways and means with the bodies and officials concerned. The subcommittee on the care, after-care, and treatment of the insane has done useful work in visiting observation wards of infirmaries; its report is expected to be very valuable in view of the changes in the poor-law. The subcommittee on mental disorders is investigating the problem of the sterilisation of the unfit, and is addressing letters to scientific bodies and public organisations asking for their views on the prevention of mental disorders and defects. Useful work is also being done on the children's courts, and a memorandum has been sent to the committee which is inquiring into the working of these courts. As the result of a successful dance organised last winter, the Council now has a respectable balance at the bank. Pioneer work of this kind, however, is always in need of larger funds and more adherents if its progress is not to be crippled. The system of associate membership with an annual subscription of only 5s. makes it possible for everyone to participate in this essential national work.

HOLOPHANE OPERATING TABLE LIGHTING.

THE makers of the ideal operating table lamp to which we called attention recently in an annotation (Dec. 28th, 1929, p. 1377) are Messrs. Holophane Limited (Scientific Illumination), of Elverton-street, Vincent-square, London, S.W. This unit was fully described at the December meeting of the Illuminating Engineering Society, and a full-size model of the unit, arranged with an operating table and other hospital accessories, is on view in the demonstration room of Messrs. Holophane Limited, where it may be inspected at any time.

APRIL CAMPAIGN AGAINST JUVENILE TUBERCLE.

THE National Tuberculosis Association is planning a campaign for the month of April throughout the United States of America on the subject of childhood tuberculosis. The purpose is to emphasise the importance of treatment in the period of latency. No treatment is to be offered through the Association, however. It will confine its efforts to education. In connexion with this a pamphlet of diagnostic aids has been prepared and will shortly be available through State and local associations. It is illustrated by coloured plates of the tuberculin reaction and with excellent aquatone reproductions of X ray plates. Emphasis is laid on the paucity of symptoms—that a child with active tuberculosis may be above weight and free from cough or fever. Physical signs may be lacking. "A rontgenogram is indispensable in the examination of a child's chest." Children with diffuse pulmonary infiltrations should not be subjected to tonsillectomy and in no case of childhood tuberculosis should competitive sport be allowed. There is great danger that excessive strain may reactivate dormant infection. Besides this booklet, evidently designed for the use of physicians, a number of brightly coloured posters have been designed. Advertisements will appear in magazines and newspapers. Motion pictures are available. All this is made possible by the sale of Christmas seals at one cent each.

Births, Marriages, and Deaths.

BIRTHS.

CARMICHAEL.—On March 29th, at East Heath-road, Hampstead, the wife of Dr. E. Arnold Carmichael, of a son.
MATSON.—On March 23rd, at Farnborough Park, the wife of R. C. Matson, M.R.C.S., L.R.C.P., of Woking, of a son.
MELVILLE.—On March 20th, at Teak-Penn, Stockingstone-road, Luton, the wife of Dr. H. R. Melville, of a son.

MARRIAGES.

FOX—MCDOUGALL.—On March 27th, at Christ Church, Wallington, Surrey, Theodore Fortescue Fox, M.A., B.Chir., son of Dr. and Mrs. R. Fortescue Fox, Beechshade, Beaconsfield, to Margaret Evelyn, elder daughter of Dr. and Mrs. W. Stewart McDougall, Benloyal, Wallington.
RAMAGE—MOLLER.—On March 25th, at St. Andrew's Church, Much Hadham, Herts, John Steven Ramage, M.B., Ch.B., F.R.C.S.E., to Mary Muriel Moller, M.B., B.S.
SIMPSON—NICOL.—On March 31st, at St. Giles-in-the-Fields, London, Dr. J. E. A. Simpson, of Southampton, to Dr. Janet C. Nicol, of Keith, Banffshire.

DEATHS.

DIXON.—On March 30th, at Jamaica-road, Bermondsey, John Dixon, M.D., J.P., aged 97.
HAYES.—On March 28th, at Ecclesfield, Clyde Longman Hayes, M.R.C.S., L.R.C.P. Edin.
HICHENS.—On March 29th, in a nursing home in London, Peverell Smythe Hichens, M.A., M.D., F.R.C.P., of Havelet House, Guernsey, aged 59.
MACKAY.—On March 30th, at a nursing home at Broughty Ferry, John Yule Mackay, M.D., LL.D., Principal of University College, Dundee.
WOODFORDE.—On March 31st, at Wolverton Mansions, Ealing Common, Alfred Pownall Woodforde, M.R.C.S., aged 78.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Hunterian Lecture

ON

PERFORATING WOUNDS OF THE EYEBALL.

Delivered before the Royal College of Surgeons of England on Feb. 5th, 1930,

BY J. HERBERT FISHER, M.B., B.S. LOND.,

FELLOW AND MEMBER OF COUNCIL OF THE COLLEGE; CONSULTING OPHTHALMIC SURGEON TO ST. THOMAS'S HOSPITAL; CONSULTING SURGEON TO THE ROYAL LONDON OPHTHALMIC HOSPITAL.

WE live in a restless and progressive age. So much that is new is evolved in so short a time that in all branches of medicine there is the risk lest in our endeavours to keep abreast with the times we succumb to the temptation to lighten the load by jettisoning the sound knowledge of the past. Anticipating that among my hearers might be found a proportion of women and men about to embark in the practice of ophthalmology, I have thought that some lessons drawn from my clinical experience might be of interest and of value.

CASE 1.—In November, 1906, a boy of 17 at one of our public schools was mixing carbon, sulphur, and chlorate of potash with a pestle in a mortar when a violent explosion occurred, and all the windows of the chemical laboratory were broken. I saw the patient some six hours later suffering much from shock, with great laceration of his hands, which became permanently crippled, while powder grains were abundant in the skin of his cheeks, nose, forehead, and eyelids. Foreign particles were embedded in the cornea and sclerotic of each eye, and in the right there was a punctured wound at the highest point of the limbus. The iris was lacerated but not prolapsed and the lens wounded and becoming opaque. A good anterior chamber was present, and the eyelids were ecchmyosed and œdematous. It was not until three weeks later that his general condition allowed me to deal with the traumatic cataract. Two examinations with X rays had failed to show the presence of any intra ocular foreign body, but on evacuating the soft cataract a small fragment of porcelain appeared through a rent in the posterior capsule of the lens, and I was able to pick it out with forceps through the corneal incision. A small quantity of vitreous was lost. The eye subsequently did very well, and with correction for its aphakia obtained full direct vision, and to my knowledge still had 6/6 nearly five years later.

CASE 2.—On the evening of Sept. 9th, 1908, in Scotland, the members of a shooting party, having had a wet day, amused themselves by throwing into the fire percussion caps which they cut from soaked cartridges. One of the explosions, more violent than the rest, resulted in the right eye of a young man being struck with some fragment but whether of coal, stone, or copper could not be determined. The next day the ophthalmic surgeon whom he consulted in the nearest large town advised immediate removal of the eye. The patient, however, decided to come to London, and I saw him two days after the accident. His right eye presented a large irregular gaping wound in the sclerotic through which vitreous was protruding. The wound was situated to the nasal side and over the posterior part of the ciliary body. The aqueous chamber was deep, as the result of the loss of vitreous, and contained a little blood. Use of X rays was obviously undesirable until the wound became solid, and I sent the patient immediately into a nursing home to maintain absolute rest. The next day the anterior chamber was very deep, in consequence of more vitreous having exuded in spite of my attempt to draw the wound together and protect it with ocular conjunctiva under a general anæsthetic. I bandaged both eyes and ordered that he be kept entirely recumbent and at rest on his back, but the patient was young and not very precise in observing my instructions. The scleral wound, however, healed slowly. On October 5th, 1908, an X ray examination was made by the later Sir Mackenzie Davidson, who reported that there was no foreign body present, either in the eyeball or the orbit. The eye was left slightly astigmatic but had 6/6 vision with a weak cylinder lens. By the end of the year he was again shooting and playing golf, and the eye kept permanently well.

These two cases indicate that detachment of retina need not by any means follow when healthy vitreous is lost, either anteriorly or through a wound of the sclerotic. In each instance the flying particle which inflicted the ocular wound—in the first case retained, in the second not retained within the eyeball—was no doubt sterilised by the heat engendered by the explosion. This fortunately is also the case where fragments of flying steel or other metal injure the eyes of workmen when chipping metal or grinding tools in engineering shops; the fragments often come off at a white heat from the impact of a steel hammer on a steel chisel.

Infection through a penetrating wound from a dirty conjunctival sac, producing panophthalmitis resulting in loss of the eye, may be a secondary complication. The conjunctival sac is particularly liable to be septic in the presence of a lacrymal mucocele. In all cases of extirpation of the lacrymal sac, and especially when this is performed preparatory to an operation involving section of the eyeball, I advise that both canaliculi be slit and their lining membrane destroyed with the galvano-cautery. I once lost an eye upon which I had operated for cataract; the eye became infected owing, I believe, to neglect of this supplement to the operation of excision of the lacrymal sac. The conjunctiva had been pronounced sterile by the bacteriologist after I had excised the sac preparatory to cataract extraction. When the eye suppurated after extraction the same bacteriologist found that it had been infected with a pneumococcus, one of the commonest and most virulent organisms lurking in a lacrymal sac mucocele. I have no doubt that the pneumococcus was lying low in the canaliculi, escaped the observation of the bacteriologist, and made its attack from this quarter upon the eyeball. The lesson is that the canaliculi should in all cases be dealt with at the same time as the sac.

Unfortunately every ophthalmic surgeon is only too familiar with the disastrous results which follow injuries inflicted with septic material. Suppurating corneæ or panophthalmitis are frequently met with in farriers, road-menders, and masons, in whom a traumatic ulcer or a perforating wound has been produced by such septic material as the parings from a horse's hoof or by flying fragments of stone.

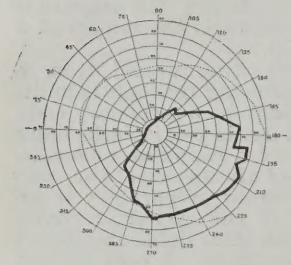
CASE 3.—Another case of traumatic cataract was that of a boy of 13, who was boiling fluid in a glass flask in a chemical laboratory when the flask burst. He only came under my observation at the hospital 17 days later, by which time a traumatic cataract in the left eye was present. There was a linear scar in the cornea running downwards and inwards; a posterior synechia of the lower pupillary margin was present, and a fragment of glass a few millimetres square lay on the anterior surface of the iris below. The eye was not inflamed. The next day I removed the fragment of glass through a corneal incision. Six months later another small piece of glass revealed itself at the lowest point of the anterior chamber, and a third angular piece was cutting its way through the lower and outer part of the iris from behind. No doubt the movement of the iris membrane facilitated this. I removed the two pieces of glass through a corneal section. A month later an X ray examination showed that yet another piece of glass was wrapped up in the lens remains. At this date, with its pupil dilated, the eye, assisted by the appropriate lens, read 6/18, but with a small pupil no clear gap was available and 6/60 could not be obtained. Rather than risk displacement of this fourth foreign body into a more dangerous situation by needling the lens, I decided to leave matters as they were. There seemed but little chance of seizing the fragment, which was completely hidden. Many years later this eye remained harmless and quiet and presented a good appearance.

How so many fragments contrived to enter the eyeball, apparently through a single wound, is rather a mystery; naturally I expected but the one first apparent. It is to be presumed that a single large splinter broke into four fragments while in the act of penetrating the cornea.

CASE 4.—A lad of 17 years of age was cleaning an incandescent electric lamp bulb on Christmas Eve, 1903, when it burst, and a fragment of glass struck and penetrated his right eyeball, in this case through the sclerotic on the nasal

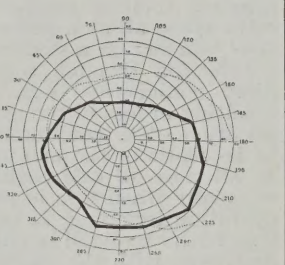
side behind the ciliary region. He was admitted to hospital on Christmas morning when, with the ophthalmoscope, a slip of glass could be seen lying transversely behind the lower part of the lens. I had the operating theatre darkened and, after enlarging the aperture of entrance, watched the fragment and guided my forceps by ophthalmoscopic observation until I succeeded in seizing the slip of glass and withdrawing it from the eyeball. It was an hour

FIG. 1.



Case 4.—Field of vision in February, 1904.

FIG. 2.



The same in June, 1904.

and a half before I was successful in manipulating the fragment so as to get it "end on" for removal; it measured ½ in. by 1/12 in. I closed the wound with conjunctival stitches; some vitreous had necessarily been lost. A month later the eye could only count fingers at a foot, and there was a large retinal detachment. The detachment was still present in February, 1904, as the field of vision indicates (Fig. 1), but great improvement had taken place by June, 1904 (Fig. 2), and in February, 1905, I could detect no detachment. The field still showed a 10° loss above, which was sufficiently explained by a degenerative scar change visible in the extreme periphery of the fundus below. The direct vision of the eye with correction for 2·0 D. of astigmatism was 6/18.

THE VALUE OF SCLERAL SECTION.

Polished glass is little likely to carry septic infection and, as is well known, is often retained within an eye with a minimum of irritation. Case 4 further confirms the view that scleral section and considerable loss of healthy vitreous, while it may be followed by immediate displacement of retina, is quite consistent with good recovery and no permanent detachment. The difficulty I experienced in conducting the manipulative manœuvres leads me to view with amazement the experimental work of an ophthalmic surgeon who claims to have been able to introduce glass cannulæ into the central retinal artery and vein of the cat and then to measure manometrically the blood pressure in each of these vessels. Even with the help of a micro-manipulator I should at least have expected that the damage done to the vessel walls was so uncertain as to render the results unreliable.

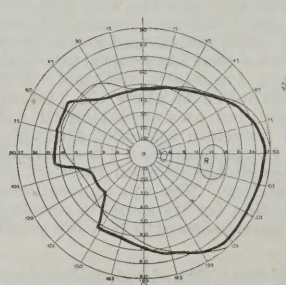
Now I come to a more ordinary case of perforating injury with retained foreign body.

CASE 5.—A man of 25 years of age was using a steel hammer on a steel chisel on Oct. 24th, 1911, when a fragment flew and injured his right eyeball. I saw him within a few hours and found a perforating wound in the sclerotic coat situated at about 5 o'clock. In the vitreous humour were some blood streaks indicating the track of a foreign body. He was sent into a nursing home, and a foreign body was revealed by X ray examination and its position located in reference to the central point of the cornea. On Oct. 26th I turned back a flap of ocular conjunctiva and inserted in the superficial layers of the exposed sclerotic two fine silk sutures, parallel to one another and about 2 mm. apart, near to the equator of the eyeball at the temporal edge of the superior rectus muscle; these stitches were left long and untied. One stitch I held taut myself, my assistant doing the same with the other while, with a Graefe's cataract knife, I cut slowly and carefully through the sclera between the two stitches until the pigmented choroid was visible. The knife was then plunged through choroid and retina, the sterilised point of the hand electro-magnet was applied to the wound, and the chip of steel was at once withdrawn. Taking at once each of the stitches into my hands I tied them together and cut them short; the conjunctival flap was then replaced and secured with fine silk stitches.

The essence of the operation is the introduction of the episcleral stitches as soon as the flap of conjunctiva has been reflected, preferably in the position indicated by the X ray measurements. While the tone of the eyeball is still undisturbed their insertion is easy. The stitches, held as directed, support the lips of the scleral incision while the sterilised point of the magnet is applied to or, if need be, introduced within the eyeball. No overflow or expression of vitreous need occur and the stitches, tied immediately after the foreign body has been extracted, close the wound securely and without delay; without them collapse of the eyeball to a greater or lesser extent is the inevitable result of the removal of a foreign body by the scleral or posterior route, and the want of this item in the technique has in my opinion unjustifiably led to the condemnation by many surgeons of this posterior operation. I am still an advocate of the scleral incision for removal of intra-ocular foreign bodies located behind the lens. We have now at our disposal very powerful electromagnets of the Haab and Mellinger type. Even when the most precise steps are followed in using these powerful tractors I consider it impossible by any means to be sure that serious damage to lens, iris, or ciliary body will not be done in pulling metallic fragments forwards into the anterior chamber from the deeper parts of the eye. I have found it quite possible to use the Mellinger pattern by the scleral route.

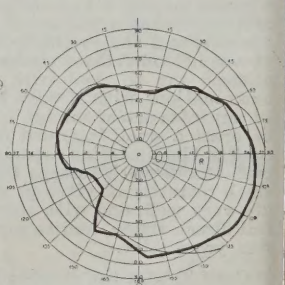
The sequel of the case narrated above was that on Oct. 29th some hæmorrhagic opacity could be seen in the vitreous, and two spots of recent hæmorrhage on the optic disc. The patient was kept in bed lying on his back. On Nov. 1st there was a detachment of retina in the outer periphery, but four days later it was much less obvious. On the 15th he was allowed to leave the home, and at this date no detachment could be made out. A week later there was still a little floating opacity in the vitreous. No

FIG. 3.



Case 5.—Field of vision in October, 1911.

FIG. 4.



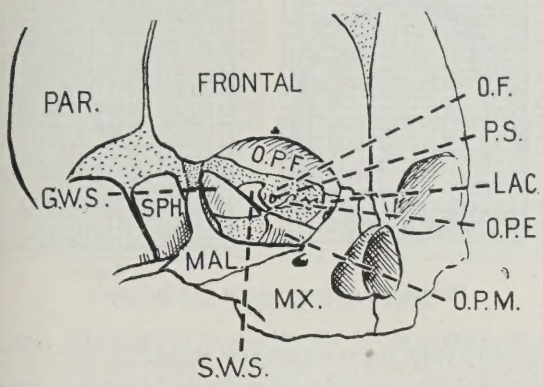
The same in March, 1912.

detachment of retina was visible; there was a slight notch of loss in the lower nasal periphery of the field of vision corresponding with the site of my scleral incision (Fig. 3). The central vision on Dec. 11th was 6/12, on Jan. 24th, 6/9, and on March 20th, 6/6; the field of vision on this date (Fig. 4) was practically identical with that charted on the previous Nov. 23rd. A year after the accident this eye read 6/5 fully, and I know from his relatives that up to 1926, 15 years after the accident, when I last had news of the patient, the eye remained quite well and had never at any time given the least trouble.

Radiographic examination has added much to our capacity to deal with all cases of penetrating injury to the eye by flying particles. The late Sir Mackenzie Davidson established his technique at Moorfields Hospital, and by means of his cross-thread localiser was able to give the most precise figures, even to within 0·5 mm., of the size of the retained foreign body and of its lateral, vertical, and posterior position in relation to the central point of the cornea. On one occasion I incised the sclerotic, using the method I have detailed above, at the point indicated by the figures supplied to me, and at once came down upon a piece of brass, which I picked out of the eyeball with a fine forceps.

The main objection raised by surgeons to the scleral incision is that the risk of inducing detachment of the retina is unduly great; my experience is that this fear is much exaggerated, and that the objection is invalid if the method of operating which I have explained is employed and adequate rest in bed is subsequently maintained. That displacement

FIG. 5.



Drawing of a skull of a five months' fœtus. Par. = parietal bone; G.W.S. = great wing of sphenoid; Mal. = malar bone; S.W.S. = small wing of sphenoid; O.F. = optic foramen; P.S. = presphenoid; Lac. = lacrymal bone; O.P.E. = orbital plate of ethmoid; O.P.M. = orbital plate of maxilla; Mx. = maxilla.

of retina may occur as an immediate result is not to be denied, but it is likely to be but temporary. The condition is not to be compared with spontaneous detachment of the retina, which is a manifestation of pathological processes, still unfortunately but little understood, and in which the prognosis is thoroughly unfavourable. When radiographic examination has furnished the figures, giving in three dimensions the position of the foreign body in relation to the central point of the cornea, it is necessary for the ophthalmic surgeon to satisfy himself whether the particle lies within or without the globe before he decides upon any operative procedure. This is best done by plotting its position on charts of the eyeball drawn to scale, and in 1916 I pointed out the erroneous use which we were at that date making of the measurements with which we were supplied. The age of the patient, if less than adult, has to be taken into account, while the eye is to an almost negligible degree smaller in the female than in the male sex.

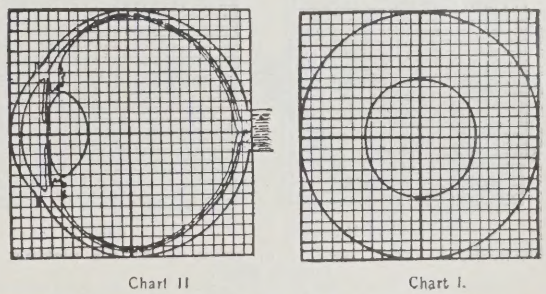
THE EYE IN INFANCY.

It is interesting to note that in the newly-born infant the eyeball is about two-thirds the size of the fully-grown globe; though an infant will multiply its weight at birth some sixteen times by the time adult life is reached, the size of its eyes increases by only some 50 per cent. The cephalic end of the embryo is of course always in advance in development; nevertheless we see nothing of contrast in the proportions of a newly-born child, though the less familiar newly-hatched fledgling from a bird's nest appears to us all head and eyes. So well is the infant's eye guarded by the bony orbit that it rarely sustains injury in the process of normal parturition; nature cannot be blamed for accidents which occur in assisted labour. The anterior outlet of the orbit at birth is quadrilateral, with fairly well-defined angles. The vertical measurement of the outlet, in contrast to that of the adult, is conspicuously less than the horizontal measurement; this diminution of the vertical height is rendered rather more noticeable by a slight upturning of the infra-orbital margin, and the lip thus formed no doubt affords some additional protection to the eyeball. The proportions of the outlet characteristic of the adult appear to be reached by a descent of the orbital floor, and not by an ascent of the roof; the supra-orbital margin in the infant bears the same relation of level to the nasion (the fixed point of the fronto-nasal suture) as in the adult. Obstetricians divide the fœtal skull into the compressible vault and the incompressible base, and in the latter category include the face. The points of ossification of the bones forming the orbit are of particular interest. The centre of ossification for the frontal bone is an early one and is found at the supra-orbital margin at the sixth or seventh week; the malar bone is one of the first in the body to ossify, while the nasal process of the superior maxilla already consists of well-formed bone some months before birth. The whole outlet of the orbit is thus well and firmly ossified before gestation is completed. For the protection of the optic nerve it is to be observed that in the sphenoid bone two centres of ossification are early laid down, one on each side of the optic foramen, about the tenth week (Fig. 5). It is also of interest to note how the nerves of common sensation proceeding through the orbit to the skin and soft tissues of forehead, temple, and cheek are throughout life safeguarded against pressure on the bony orbital margin. The supra-orbital nerve at the outlet is lodged in a notch, which is sometimes completely bridged over, while if it appears as two branches the smaller inner branch may also be lodged in a supernumerary notch. The infra-orbital nerve as it passes forward first sinks into a groove and then passes into a tunnel on the floor of the orbit to emerge at the infra-orbital foramen. The temporo-malar nerves tunnel the malar bone to deliver malar branches to the prominence of the cheek and recurrent branches to the temple. All these sensory nerves are thus protected from pressure, to which they would have been liable if they had made sharp turns on the bony orbital margin.

PLOTTING ON A CHART THE POSITION OF A FOREIGN BODY.

Fig. 6 is a reproduction of charts in use at Moorfields Hospital up to the year 1916; the circles on Chart I. represent the cornea and the maximum circumference of the eyeball in transverse section.

FIG. 6.



Charts in use at Moorfields up to the year 1916.

What Chart II. was intended to represent it would be difficult to say; it was utilised either as a horizontal or a vertical section in the sagittal plane. If it be regarded as a horizontal section, the stump of the optic nerve should be shown to the nasal side and not at the posterior pole, necessitating also different charts for the right and left eye, while if it is to be taken as a vertical antero-posterior section the optic nerve should not appear at all. The measurements depicted are not the mean of the extreme diameters of the eyeball, as they should be, seeing that the sclerotic does not form a perfect sphere. The diagrams are more nearly correct for the male than for the female eyeball, but as the difference in the two sexes is slight this is a matter of no great importance, especially as the injuries with which the charts are concerned happen but rarely to the female sex.

More important even than the faults in the charts themselves was the method which was used to plot

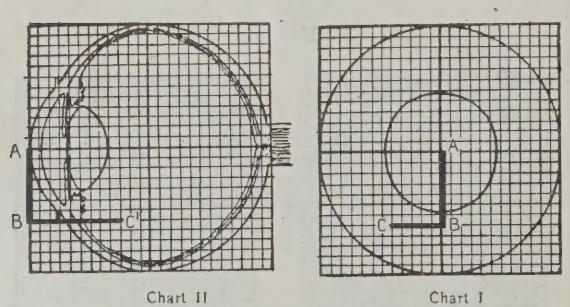
on them the site of a foreign body as intra- or extra-ocular. The figures supplied by the radiologist were the three measurements of the site of the foreign body, vertically, horizontally, and posteriorly, in reference to the central point of the cornea. That such exact practitioners as ophthalmic surgeons should have been in the habit of using in combination only two at a time of the three measurements given is hardly to be believed. Yet so it was, and at a time when in military surgery large numbers of penetrating wounds of the eyeball were being met with, supplemented by those sustained by workers in arsenal and munition factories, I pointed out the grave error we were making. The following is a quotation from my paper [1]:—

"Let us suppose from the X ray examination that the foreign body is 7 mm. below, 5 mm. to the temporal side of and 9 mm. posterior to the centre of the cornea. On Chart I., ruled to scale in millimetre squares, we count 7 mm. downwards from the corneal centre A and reach the point B; we then count from B 5 mm. to the temporal side and reach the point C [Fig. 7]. As far as this diagram is concerned we conclude that the foreign body is intra-ocular, but it must also be within the limits of the globe, as outlined in the antero-posterior section, before the point is finally settled. We proceed to determine its position on Chart II., and again we count 7 mm. vertically downwards from the anterior pole reaching the point B, and then 9 mm. horizontally backwards and we arrive at C′, and again find that the foreign body is located within the confines of the eyeball. I am assuming that Chart II. represents a vertical antero-posterior section, as it is usually taken to do.

"Now it is obvious that C′ cannot be the true position of the foreign body, for we are representing it on a mid-line section, and we know that it lies 5 mm. to the temporal side of this section. Moreover, to determine the relative position of two points in space involves the use of three co-ordinates, and though supplied with the three required we are using but two of them at a time.

"Wherein then do we go wrong? Making use of our charts again, what we have to do after marking out A B, 7 mm. and BC 5 mm., is to draw the line AC, and determine its length. ABC being a right-angled triangle, this is an easy

FIG. 7.



Illustrating incorrect method of using charts for plotting a foreign body.

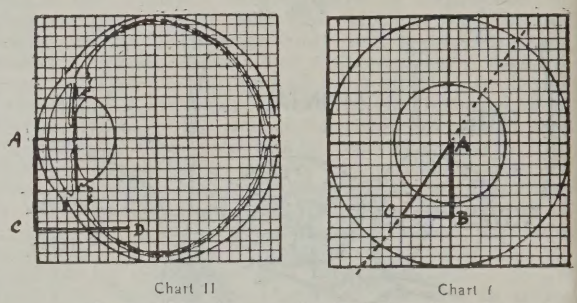
proposition to solve, for $AC^2=AB^2+BC^2$., i.e., $AC^2=49+25=74$, and $AC=\sqrt[2]{74}=8{\cdot}6$ mm. approximately. Now Chart II. is to be taken as an antero-posterior section of the eyeball, through its poles but cut in the oblique plane AC; and on it from the central point of the cornea we have to count down not 7 mm. and find the point B, but 8·6 mm. when we reach the point C; from this point we count backwards 9 mm. and if the spot arrived at, D, is within the limits of the globe, as outlined in the diagram [Fig. 8], the foreign body is truly intra-ocular. It will obviously appear in the chart whether intra- or extra-ocular, for the chart represents a section in the plane in which the foreign body lies.

"It is easy to show that we may arrive at a conclusion which might be disastrous to a patient, unless we do our work correctly.

"Let us revert to our previous example with this single difference—viz., that we will now assume the foreign body is reported to be 4·5 mm. posterior to the central point of the cornea, instead of 9 mm., the other measurements being 7 mm. downwards and 5 mm. to the temporal side, as before.

"If, using Chart II. incorrectly in the way in which it has hitherto been employed, we count 7 mm. downwards and 4·5 mm. backwards we find the foreign body is located in the most dangerous part of the eyeball—namely, the ciliary body—but if, using our charts correctly, we regard the antero-posterior section (Chart II.) as one cut on the oblique plane AC and count, as we should, 8·6 mm. downwards and 4·5 mm. backwards, we find the foreign body is lodged harmlessly

FIG. 8.



Illustrating correct method of using charts.

on the surface of the sclerotic, over the posterior part of the ciliary body, and is really extra-ocular."

To avoid the use of arithmetic and facilitate calculation, new and more accurate charts are now in use (Fig. 9). On the "en face" chart are ruled circles centred on the central point of the cornea and of radii 1, 2, &c., up to 12 mm. The length of the line AC is by this means automatically determined by these circles, and the correct site of the located foreign body is readily and accurately plotted. It appears to me that Gonin's very ingenious method for deciding, on the eyeball, the diameter on which an observed hole in the retina lies, might well be used in dealing with intra-ocular foreign bodies situated in the vitreous chamber. With this addition to our radiographic measurements and charts, our hopes for the successful removal of non-magnetic foreign bodies through scleral incision should be decidedly improved.

Correct plotting of the position of a foreign body in relation to the central point of the cornea is well illustrated by the following case.

CASE 6.—Captain X sustained an injury to his left eye by a pellet of No. 6 shot on Oct. 6th, 1917. I saw him eight hours after the accident. There was considerable subconjunctival ecchymosis. The pellet had produced a dent in the sclerotic on the outer side behind the ciliary region, but the tension of the eye was normal and no vitreous was exuding. With the ophthalmoscope, after use of a mydriatic, no track of any foreign body could be seen in the vitreous, which was free of haze and of hæmorrhage, but the retina was almost everywhere grey from concussion œdema. This œdema had diminished two days later, but was still present at the centre and to the outer side. One or two spots of hæmorrhage were now visible in front of the retina and extending far forwards into the lower part of the vitreous. Radiographic examination revealed a pellet in the position indicated by the accompanying charts (Fig. 10), which showed the foreign body to be extra-ocular. Had the same measurements been employed as formerly the inference would have been that it lay within the eyeball. As a matter of fact, though the sclerotic had been struck, it had not been penetrated by the pellet, which indeed I removed from the orbital tissues. The intra-ocular changes had been produced by concussion. The hæmorrhage gradually absorbed; the retinal œdema resulted in the formation of some yellowish-white dots arranged in an arc outside the yellow spot region, and these were still present when I examined the eye some six or seven years later. In the lower periphery near the site of impact some slight pigmented changes in choroid and retina were also permanent. There was never any displacement of retina, and the direct vision of the eye corrected for its myopia, recovered to 6/9.

TRAUMATIC TUMOURS OF THE IRIS.

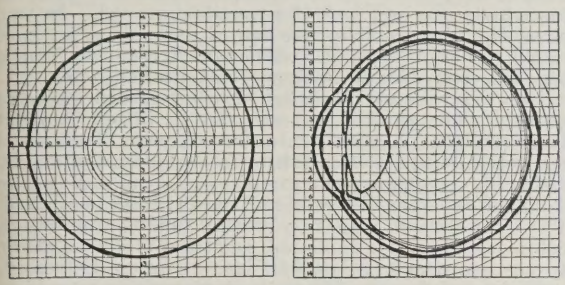
I come now to a rather infrequent sequela of a penetrating injury—namely, the formation of a cyst in the aqueous chamber.

CASE 7.—On July 29th, 1912, I excised an iris prolapse through a wound at the highest point of the limbus of the right eye. The injury had been inflicted by a missile

[1] Ophthalmic Rev., 1916, xxxv., 175.

possibly a screw, thrown at a boy 17 years of age, a few hours before he was brought to me. A neat upward coloboma of the iris was the result of my operation, and vision was unimpaired. On July 10th, 1915, my patient was serving as an officer in France when the same eye gave trouble after receiving a further slight injury with a twig, and Sir William

FIG. 9.



Charts now employed at Moorfields.

Lister recognised a cyst of the iris. On August 26th, 1915, I punctured the delicate grey wall of a cyst of the iris lying at the bottom of the anterior chamber. The cyst was somewhat lobulated and its anterior wall was slightly pigmented. The cyst collapsed, but a month later it was obviously re-forming, and on Oct. 27th, 1915, I made a section downwards with a Graefe's cataract knife, punctured the cyst in doing so, and performed a small iridectomy downwards, through both anterior and posterior laminæ of the iris tissue. Five weeks later I had to deal with a small knuckle of iris pillar prolapsed through the section; I removed the knuckle and covered its site with a flap of ocular conjunctiva.

The eye did well, but was now the subject of a double keyhole pupil. Though it was highly astigmatic from distortion of the corneal curvature, it could read 6/6 with the help of the appropriate cylinder lens. In this condition it remained permanently; the patient resumed his active war service, and was last seen by me in 1924. At this date a residue of the cyst wall remained and presented the appearance of a bracket at the bottom of the anterior chamber; the temporal horn of the bracket showed definitely some pigmented iris tissue. The nasal horn consisted of a remnant of the grey cyst wall and was devoid of any uveal pigment.

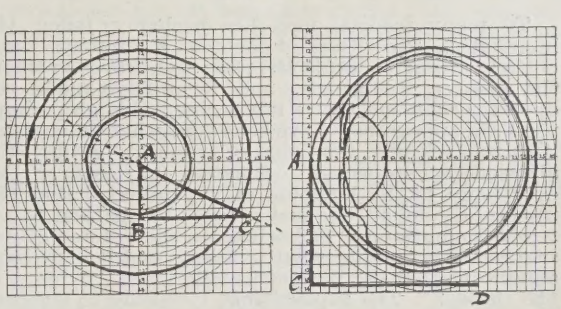
Traumatic tumours of the iris arising from implantation of epithelial cells are of two kinds. If corneal epithelium is carried into the iris the implanted epithelium proliferates, the central cells of the tumour —at first solid—degenerate, and a cyst is formed, the wall of which consists of stratified epithelium. The fluid contents are either serous or slightly turbid, and the iris membrane is often split by the cyst into two layers, of which the anterior is usually thinner than the posterior. Cysts of similar origin and construction have been described in the cornea. Another form of implantation tumour of the iris is the solid epithelial pearl tumour. This consists of epithelial cells, together with fat, sebaceous matter, and cholesterin crystals; the contents in time may become somewhat liquefied. This form of tumour arises from an eyelash, or from the cells of the root sheath of an eyelash which have been implanted in the iris tissue by the perforation. It seems unlikely that the cyst in the case I have just narrated belonged to either of these two classes. Remnants of implanted cells were certainly left behind by me in the iris tissue, and had these cells been epithelial further proliferation should have taken place. This did not occur, and I conclude that my case belonged to a third class of iris cyst—namely, the anterior chamber cyst with endothelial cell wall. Cysts of this class present clinically much the same appearance as the epithelial implantation cysts; their walls are transparent and their contents clear fluid. They are attributed to obstruction in the mouth of a crypt in the iris membrane, whereby lymph is retained, and they have been repeatedly observed to form after a penetrating injury, though they may occur without any trauma. It has been suggested that endothelial cells are carried in from the back of Descemet's membrane and may possibly play a part in the cyst formation in the cases preceded by penetrating injury. This form of cyst, a retention cyst, is likely to be permanently cured by simple puncture or generous excision of its wall, as happened in the case I have reported.

It will be seen, therefore, that when an eyelash has been carried into the anterior chamber by injury—and is seen lying upon the iris, it is important to remove it. This is a remarkable but not a very rare occurrence. To remove a lash from this situation is not always quite as easy as would be imagined. Attempts to grasp it with a forceps introduced after a keratome section usually result in the iris bellying up, so that this membrane is seized simultaneously with the lash in the branches of the forceps. I have found it simpler to pass a curette, with its groove directed anteriorly, over the iris and behind the lash, through a suitably placed section. A flexible Tyrell's blunt hook can then be guided in the groove of the curette behind the lash. The lash, macerated and pliable, can readily be engaged at its middle by the hook and withdrawn from the anterior chamber doubled upon itself; the difficulty which the iris membrane otherwise offers is thus readily overcome.

Siderosis.

The degenerative changes which occur in an eyeball in which an iron fragment has been retained over a long period are known as siderosis and result in degeneration of the eye. An iron-containing pigment is deposited in the tissues and particularly in the retina, pars ciliaris and pars iridis retinæ and in relation to the lens capsule. Much argument has waged as to whether this pigment is derived from the retained foreign particle or is of hæmatogenous origin. Widespread green staining appears in the tissues of an eyeball which has harboured a particle of copper, a metal which, by the chemical changes which it will undergo, is universally recognised as

FIG. 10.



Illustrating site of foreign body in Case 6 plotted correctly on improved chart.

most destructive when it is retained within the eye. Such green pigment is certainly not hæmatogenous, and comparison of the two conditions leads to the inevitable conclusion that in siderosis the iron-containing pigment is derived not from the blood but from the retained foreign body.

A TRANSPARENT LIVING LABORATORY.

The development in eyes of implantation growths, solid and cystic, is a reminder that the pathological processes with which the ophthalmic surgeon has to deal are identical in origin with those experienced in other parts of the body; in every structure the result will be modified by and adapted to the soil in which the process develops, but in the eye alone can the development be viewed directly by the observer.

I have with the ophthalmoscope watched a patch of solitary tubercle manifest itself in the choroid, and absorb and resolve into a scar under the influence of tuberculin injections. In the eye we may watch

syphilitic processes develop and subside under treatment. Inflammatory processes from direct or indirect microbic implantations or from great varieties of toxæmia come under our notice. Gas gangrene occasionally proceeds under our eyes. Pathological processes produced by organic and inorganic poisons are well known to the ophthalmic surgeon. Blood and vascular disorders are watched in the retina, which is only a detached portion of brain tissue. The organisation of fibrous tissue in relation to blood-clots can be observed in progress. Slit-lamp observation has added to the resources which the ophthalmoscope supplies. We frequently have opportunities to study primary malignant growths, both of epiblastic embryonic cells in connexion with the retina and of mesoblastic cells with the choroid, while secondary metastatic deposits are not uncommon.

The eye is a transparent living laboratory in which more work, both experimental and clinical, might perhaps be done by the research worker and the expert pathologist. In no other tissue of the body can we so closely relate the post-mortem finding to the observed living process. The tendency of the age is towards scientific medicine. How much of this is real scientia? Does it not tend to grow top-heavy, based too much on hypothesis? How much do we see accepted and discarded by our profession in a single life-time? Hypothesis is a necessary aid in prosecuting research, but, until proved to be fact, is no sure foundation for the practice of medicine and surgery.

PARAPHARYNGEAL ABSCESS.

THE QUINSY THAT ISN'T.

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To many medical men has probably fallen the humiliating experience of incising a "quinsy" and entirely failing to locate the pus; and this even where the history, symptoms, and fever have made the operator confident that "it was ripe," though perhaps the local appearances have been somewhat anomalous. As a rule, within a few hours or at most a few days the abscess is spontaneously evacuated. A closely similar occurrence is the bursting of a "quinsy" that the medical attendant has just assured the patient is not ready for incision. In both cases the volume of pus makes the error somewhat puzzling, and it is perhaps significant that the patient usually says, "it burst in the throat." The explanation, I venture to suggest, is in many cases that the abscess is not a true peritonsillar collection at all—that is, situated between the capsule of the tonsil and the sinus tonsillaris—but lies posteriorly in the lateral wall of the pharynx. Such an abscess is sometimes described as "peritonsillar but behind (or external to) the tonsil" instead of in the customary position above it. Though unusual, true peritonsillar abscesses are found in these situations. But the condition now under discussion is a suppuration in the bucco-pharyngeal aponeurosis behind the palato-pharyngeus muscle and posterior faucial pillar. It tends to point in the pharynx about the level of the lower pole of the tonsil, in the potential gap between the palato-pharyngeus muscle in front, the lower border of the superior constrictor above, and the stylo-hyoid ligament (with the middle constrictor) behind. These relations can generally be made out at operation: cases such as (1) and (3), where the tonsil was removed, demonstrate that the abscess is not peritonsillar. I have twice been able to verify the position of the opening in cases of spontaneous evacuation. This condition has clinical features that distinguish it from peritonsillar abscess. It deserves to be classified as a separate entity, if only because a special line of treatment is required, and I prefer to describe it as parapharyngeal.

Clinical Features.

The age and sex of my patients since 1925 were:—

M. 13 (d), 20, 23, 28, 36 (d).
F. 25, 26, 30, 32, 32, 35, 45 (t).

Five of the patients gave histories of previous quinsies, for which one had had the tonsils removed. In two more the abscess followed dental extraction without tonsillitis (d. d.) and in another (t) it resulted from a vigorous but vain probang search for a fish-bone.

In a typical case the onset closely resembles that of quinsy. The patient, a young adult, often "subject to tonsillitis," has an acute sore-throat. Instead of resolving, this persists, with unilateral pain, dysphagia, difficulty in opening the mouth, and swelling deep in the neck between the angle of the jaw and the hyoid. The temperature ranges to 100° or 102° F., the breath is foul, and the tongue coated, and there is constipation. In a severe attack the patient may be much distressed.

On examining the throat (not always an easy task) the tonsil of the affected side is seen to be pushed inwards and often apparently enlarged. The striking feature is the absence of œdema of the mucosa of the soft palate and uvula; this œdema is a constant accompaniment of a true peritonsillar abscess, except in the very first hours, and often suffices to hide the tonsil, even when this is swollen and pushed inward. Closer inspection in parapharyngeal abscess shows that the tonsil is conspicuous, both on account of its displacement and because it is rotated forward so that we see the inner surface. If the attack began with tonsillitis there may be traces of this remaining, but neither anterior faucial pillar nor uvula is appreciably swollen. The posterior pillar is displaced inward more than the tonsil itself, and behind it the lateral pharyngeal wall bulges so that the recess is obliterated. In *this* region the mucosa appears œdematous, particularly if the tongue is well depressed to give a low view. The tonsil is usually not even tender on pressure, but the posterior swelling is boggy and often exquisitely sensitive; low down in it an area of pointing may be palpable.

Corresponding with the absence of palatal œdema, the voice has not the muffled tone so typical of quinsy. The cervical swelling tends to be more considerable than is usual with quinsy and is often rather a deep boggy infiltration than an adenitis, though the latter may coexist; the area tender to deep pressure is more extensive than we should expect. The dysphagia also is apt to be more severe than with quinsy, where only the worst cases are completely unable to swallow. Here this symptom is not uncommon, and seems out of proportion to the throat appearances. The patient may have to lie on one side to avoid constant disturbance from saliva overflowing into the trachea. When by an effort he can swallow fluids, he soon finds that *c'est le premier pas qui coûte*—the first gulp is the painful one. An occasional "long drink" is consequently much preferred to frequent sips.

In addition to pain on swallowing there may be constant aching in the side of the throat and neck. It does not as a rule radiate to the ear, as with quinsy, but may be sufficiently intense to need full doses of opium. Difficulty in opening the mouth is not due to trismus but to the neck infiltration and the pain of muscular activity; the patient may be able to open the mouth with the hand when he cannot in the ordinary way. Pain of all sorts tends to diminish as the abscess begins to point. In those cases where I have been able to secure pathological examination of the pus a streptococcal infection has been reported.

Diagnosis and Course.

Diagnosis rests on the manifest signs of suppuration in the region indicated, and differentiation from a true peritonsillar abscess on the features just enumerated, especially the absence of palatal œdema. With a tonsillar or with a true post-peritonsillar abscess there is a recess behind the posterior faucial

pillar, though this may be difficult to determine until the patient is anæsthetised. Retropharyngeal abscess is rare after the fourth year; it lies behind the pharynx, though usually not in the mid-line, and cervical adenitis is not a conspicuous feature. The signs of suppuration should prevent confusion with a gumma or neoplasm, though many sarcomata of the tonsil have been incised in error.

The abscess tends to point in the pharynx and in many cases ruptures spontaneously. Unless relieved by nature or art, suppuration may extend into the deep cervical planes with disastrous results. Septicæmia, mediastinitis, jugular thrombosis, and even erosion of the internal carotid artery* have all been recorded in circumstances that leave no doubt that an abscess of this type was involved. In my own series there have been no serious sequelæ, but all these cases opened or were opened into the pharynx. Laryngeal œdema probably need not be feared, though it is in the post-peritonsillar type that it is apt to occur.

Treatment.

In view of the grave possibilities the abscess should be opened as soon as the surgeon feels there is pus present. A general anæsthetic is necessary, and for this nothing is so suitable as ether given by the open drop method. Before the anæsthetic is started a gag (e.g., Sydenham's) should be placed between the patient's teeth, or at least a "mouth-opener"; Killian's "long speculum for median rhinoscopy" is excellent. As with all such operations, a tracheotomy set should be ready. For those who like it, an aspiration pump may be useful. The patient should be arranged so that the head can be readily and rapidly lowered in case the abscess ruptures during induction. With the head fully extended, so that the vertex is downward, the mouth is well opened. The swelling is palpated and as a rule an area of pointing can be made out as described; the abscess is then opened in that area, or, if it is not felt, at the spot mentioned—viz., immediately behind the posterior faucial pillar at the level of the lower end of the tonsil, directly outwards or a trifle forwards. For opening the abscess only a really blunt instrument is permissible. I generally use a very blunt tracheal dilator; when closed it readily penetrates the softened mucosa and can then be opened in a longitudinal direction to give free exit to the pus. Once when this was not available a tongue depressor served perfectly, and on three occasions the gloved finger-tip has sufficed. A really blunt instrument can be passed outward without fear if pus is not struck at once, as it generally is; a narrow or sharp instrument could not be used thus.

After-treatment presents no special features. The patient may find a difficulty in opening the mouth properly for some days or even weeks, owing to the infiltration of the muscles, especially, it would seem, the digastric; he should be encouraged to exercise this function often, stretching the mouth to maximum gape two or three times in succession several times a day.

Where the abscess is not opened by the manœuvre described it must be approached from without. An incision along the anterior border of the sterno-mastoid will give excellent access. The digastric muscle being retracted backward, the area is approached a short distance above the hyoid bone and behind the margin of the hyoglossus. The operator should be prepared to deal with bleeding from the large vessels, which are sometines exposed in the abscess cavity, but the line of approach just indicated lies far enough in front to avoid creating trouble that is not already present.

Case Reports.

CASE 1.—A man of 20. His medical attendant told me that tonsillitis had started 16 days before. On the eighth day, feeling certain that there was a peritonsillar abscess, he had incised the palate above the right tonsil and had explored the tissues with Sir StClair Thomson's quinsy forceps, but without result. He had waited in daily expectation of spontaneous opening until the fifth day from then (thirteenth day of the disease). Difficulty in swallowing and in opening the mouth had become severe, and he made a second incision and exploration but with no greater success; both operations had been done under general anæsthesia. On examination, which was considerably hampered by pain in opening the mouth, the tonsil was seen not to be swollen, but to be pushed forward by a large swelling of the lateral pharyngeal wall. There was no œdema of the soft palate or uvula and the incision was healing; but a deep cervical infiltration present for some days was now conspicuous and brawny. Under general anæsthesia the tonsil was dissected out very easily, but without revealing the abscess. The pharyngeal swelling was palpated, and behind where the lower pole of the tonsil had been the examining finger passed easily through an aperture in the submucous tissues, tearing the mucosa and evacuating a large and very offensive abscess. Two days later all symptoms had disappeared, except difficulty in opening the mouth, which persisted for a month.

CASE 2.—A woman of 34 came complaining of a sore-throat for four days with some difficulty in swallowing. She had once before had a quinsy. On examination I found the right tonsil pushed forward and inward, not swollen; there was no œdema of the mucosa of soft palate or uvula, but there was an obvious bulging of the lateral pharyngeal wall immediately behind the tonsil. A tender, ill-defined swelling could be felt deep in the neck behind the angle of the jaw; the temperature was 100° F. Treatment was by salicylates and external heat. Three days later the pharyngeal swelling was still more prominent, but did not involve the posterior wall; there was no palatal œdema. The cervical swelling was larger and firm, with considerable dysphagia and difficulty in opening the mouth; the temperature was 102·2° F. Under general anæsthesia the pharyngeal swelling was palpated, and an area found rather low down—i.e., distinctly further down than the lower pole of the tonsil—where instead of the general rather boggy firmness there was a palpable gap in the submucous tissues. A blunt tracheal dilator passed into this with very little pressure, and on opening it half an ounce of rather offensive pus was liberated. Recovery took place in five days.

CASE 3.—A woman of 30 had had several quinsies, and about two years ago I dissected out the tonsils. Nine months later she came to me with the story that she had got another quinsy; there had been pain in the right side of the throat for three days, with great dysphagia and difficulty in opening the mouth. There was no trace of tonsil, but behind the right posterior faucial pillar a large swelling was visible, pushing in the pharyngeal wall; the deep tissues of the neck were tender but not manifestly swollen; the temperature was 100° F. Shortly before operation, early next morning the abscess burst "into the throat," discharging a quantity of very offensive pus and bringing instant relief.

CASE 4.—A boy of 13 came complaining of pain in the left side of the throat and the left ear for six days; there had never been any previous trouble in either. Eight days before the onset a right upper molar had been removed but no abscess had been found under it. There was great difficulty in opening the mouth, and some dysphagia; the temperature was 102° F. On examination the left tonsil was seen to be pushed forward and also rotated forward by a swelling in the lateral wall of the pharynx behind the posterior pillar; the swelling caused some protrusion of the palate above the tonsil, but there was no œdema of the mucous membrane. Between the angle of the jaw and the hyoid a deep and tender swelling was found, apparently adenitis with much peri-adenitis. Under general anæsthesia the pharyngeal swelling was palpated, but no area of softening was discovered. Gentle pressure with a blunt tracheal dilator in the usual site produced a gush of offensive pus. Two days later all symptoms had disappeared and the tonsil looked normal.

CASE 5.—A woman of 26 came complaining of sore-throat for eight days, at first bilateral, but during the last two days on the left side only, much more painful, and accompanied by swelling in the neck. For one day she had been unable to swallow anything. Four years before she had had a quinsy. On attempting examination it was almost impossible to open the mouth. When this was achieved, the left tonsil was seen to be red, conspicuous, and pushed forward and inward; there was no œdema of the palate. Below and behind the angle of the jaw was a deep, hard, and tender infiltration. The temperature was 100·4° F. Under anæsthesia the same evening the mouth was properly opened and a prominence of the pharyngeal wall immediately behind the tonsil was palpated. A "gap" was felt level with the lower border of the latter and the gloved finger-tip passed easily through the mucous membrane at this point, liberating about one ounce of very foul pus. Two days later all general symptoms had disappeared, and a week after the operation she was perfectly well.

CASE 6.—A married woman of 32 complained of sore-throat for six days, with some difficulty in swallowing. There

* Mayer, O.: Wien. klin. Woch., April, 1926, p. 508; Negus, V. E.: Proc. Roy. Soc. Med. (Sect. Laryngology), 1929, xxx., p. 516.

was some enlargement of the glands on both sides behind the angle of the jaw, and on the left the swelling was great, ill-defined, and very tender. The left tonsil was swollen and pushed forward by a swelling behind it, but there was no palatal œdema. Next day under general anæsthesia the swelling was palpated and found to be in the lateral wall of the pharynx; behind the tonsil was an area of softening and the gloved finger-tip opened an abscess. In six days she was perfectly well.

The following case was not under my care, but I had exceptional opportunities of observing symptoms and progress.

CASE 7.—A medical man, aged 36, had had the left lower wisdom tooth removed three weeks earlier for caries; there had been no abscess. The pain was not relieved but got steadily worse, and was felt behind rather than in the jaw. For three days he was unable to swallow saliva, and for one day could swallow nothing at all, nor could the teeth be separated except with the hand; sleep was obtained only with large doses of morphine. He sought a surgical colleague and asked him to open the abscess which, from his sensations, especially on movement, he located "deep to the hyoglossus at its posterior border." Incisions were made in the mouth along both sides of the jaw and the tooth socket was curetted, but without finding pus. Some relief followed, though opening the mouth remained difficult, but high temperature persisted and he looked and felt very ill. A consultation was held, at which the diagnosis of peritonsillar abscess was suggested, but he declined to accept this; the tonsil was not swollen or tender, there was no palatal œdema, and a swelling could be felt in the pharyngeal wall below and behind the tonsil. Six days after the operation he felt a tickling in the throat, and a large abscess opened rather gradually; the pus coughed up literally "stank the house out!" The opening of the abscess was discernible later, rather low down in the lateral wall of the pharynx. Though all other symptoms rapidly subsided, five weeks elapsed before he could open the mouth in the normal manner.

Summary.

(1) Parapharyngeal abscess resembles in its clinical features peritonsillar abscess; the most striking difference is the absence in the former of œdema of the palatal mucosa.

(2) The condition should be suspected when a "quinsy" appears to run an anomalous course, or when incision in the usual site above the tonsil fails to locate pus.

(3) The abscess tends to point low in the side of the pharynx behind the posterior faucial pillar; it is easily opened here by slight pressure with a blunt instrument, which alone is permissible.

A STUDY OF THE ANTIRACHITIC VALUE OF IRRADIATED YEAST.

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As yeast is the richest known source of ergosterol a study of the extent of its usefulness after activation by ultra-violet rays deserves attention. As far as we are aware, A. F. Hess [1] was the first to test the antirachitic potency of irradiated yeast. He administered daily to rachitic infants "from 0·5 to 1 g. doses, suspended in milk. This preparation was readily taken and brought about . . . a definite curative process." The yeast was also tested on rachitic rats and caused calcification of the epiphyses when from 10 to 25 mg. were given daily. Smaller amounts were not tested. Though these preliminary observations were highly encouraging, the therapeutic possibilities of irradiated yeast have not since been given much attention. Kirsch, in 1928,[2] described experiments on rats wherein good results were obtained; he used, however, very massive doses, from 0·5 to 1 g. per rat daily. Wachtel [3] recently published a paper on "the increase and vitamin enrichment of mother's milk and cow's milk by means of irradiated yeast." It is stated there that "cenomilchquell," probably a commercial preparation, the composition of which is not given, "containing irradiated yeast as the most important and predominant component," is extremely effective in promoting the milk-flow of lactating mothers. The administration of irradiated yeast (amount not stated) to milch cows is said to have a very favourable effect on the quantity of the milk produced and its antirachitic value. Clinical results are not given but, according to Wachtel, the "yeast-milk" will be given a practical test this winter in a pædiatric clinic.

One of us (S. K. K.) was interested for some time in the problem of ultra-violet activation of yeast and, during a visit to the United States a year ago, had the opportunity of discussing with Dr. Hess the therapeutic possibilities of such irradiated yeast. He was encouraged by the latter to try the yeast in Poland. This was mentioned by Dr. Hess in a recent paper [4] and, though the conditions in our country with regard both to the severity of rickets and to the economic situation are not so hard as pictured by him, yet the cost of treatment will without doubt be of the utmost importance in deciding the issue of any large-scale antirachitic action in Poland. Reliability, low price, and ease of preparation are essential if an antirachitic product is to gain access to those classes of the population where rickets is common. Irradiated yeast seems to fulfil these requirements to a remarkable degree. According to Hess,[5] "there may well be a field for this preparation, especially where the matter of expense is of primary importance. Activated yeast can be prepared at low cost and is sufficiently potent for all therapeutic purposes."

The present communication is the result of a coöperative investigation started by the State Institute of Hygiene in Warsaw in order to gather reliable experimental information on the practical value of this and other antirachitic preparations. It is of a preliminary nature, firstly because of the limited experimental data presented, and, secondly, because it covers only a small part of our scheme and leaves many important problems pertaining to irradiated yeast untouched. As we believe, however, that the results obtained are so far conclusive and reasonably accurate, we deem it advisable to publish this account.

Experimental Method.

Pure baker's yeast was used. It was always purchased fresh directly from the same reliable factory, brought immediately to the laboratory, and spread on paper until air-dry. It was then ground in a laboratory mill, and then in a ball-mill to an impalpable powder, and stored at room temperature in glass-stoppered jars. For activation the yeast was spread by means of a sieve in thin layers (50 g. on an area of 52 by 34 cm.) on metal trays and exposed to the radiations of a Hañan quartz mercury-vapour lamp (180 v. 7·5 a.) for 30 minutes. At the end of 15 minutes the layer of yeast was resifted, in order to expose a fresh surface to the action of the rays. No effort was made to exclude oxygen. After irradiation, 0·75 g. portions of the yeast were weighed out and sent to the children's home for testing.

The experiments were carried out on a group of 12 rachitic children, inmates of the municipal home, ranging in age from 4 months to 2½ years. Six of them were given irradiated yeast, three controls the same amount of non-irradiated yeast, while three other controls were kept on the institutional diet without any addition. In the course of the investigation all these children were kept under uniform conditions, partaking, according to age, of the diets usually employed in this institution. The experimental results are given in the Tables. The yeast was

TABLE I.—*Effect of Irradiated Yeast on Infantile Rickets.*

—	Date.	M.Z.	R.F.	Wan.	A.A.	P.I.	Mu.
Age (mths.).	—	6	6	7	5	6	6
Weight (kg.).	—	4·5	4·7	5·9	4·0	3·8	5·1
Serum calcium mg. per 100 c.cm.	1/12/29	10·0	10·2	10·7	—	10·4	10·1
	11/12/29	10·4	10·5	10·0	—	10·0	11·0
	21/12/29	10·6	10·6	10·9	10·6	—	10·9
	5/ 1/30	10·4	10·4	10·8	9·5	9·9	10·1
	20/ 1/30	10·9	10·8	11·1	11·0	10·5	11·2
Serum phosphorus mg. per 100 c.cm.	30/10/29	2·78	2·67	3·20	3·53	4·50	4·03
	20/11/29	2·86	2·98	3·33	3·54	3·67	4·12
	1/12/29	5·30	4·27	4·85	5·45	6·00	6·97
	11/12/29	7·57	6·87	5·14	7·12	6·50	6·71
	21/12/29	6·35	6·05	6·33	6·38	—	5·92
	5/ 1/30	7·31	5·42	6·00	5·55	5·36	6·00
	20/ 1/30	5·86	6·34	6·38	7·50	5·77	7·14
Craniotabes.	20/10/29	+	±	±	+	±	±
	3/12/29	+	+ +	±	±	+	} +
	20/12/29	—	} +	—	—	—	} =
	16/ 1/30	} +	} =	—	—	—	—
	21/ 1/30	} =	—	—	—	—	—
Radiograms.	6/11/29	Mild rick.	Def. rick.	Def. rick.	Def. rick.	Osteop.	Normal
	24/11/29	Worse.	Worse.	Worse.	Much worse.	Rick.; osteop.	Mild rick.
	25/12/29	Heal.	Heal.	Adv. heal.	Adv. heal.	Heal.	Normal.
	11/ 1/30	Almost comp. heal.	Adv. heal.	Comp. heal.	Comp. heal.	Healed.*	,,
Remarks.	—	Whooping-cough in Jan.	Bronchial asthma in Dec.	—	—	Had diphth. of nose and otitis media.	—

Rick. = rickets; def. = definite; adv. = advanced; comp. = complete; heal. = healing; osteop. = osteoporosis.
* Slight deformity of epiphyses.

administered once daily suspended in the milk mixture, and was readily taken. There were no gastro-intestinal disorders. The administration of the yeast was continued even in the presence of intercurrent illness associated with fever.

Calcification of the cranial bones was generally the first clinical sign of improvement, craniotabes disappearing in the course of two to four weeks. This was followed by an increase of muscular tonus. Radiologically, advanced healing could be noticed in the course of one month, while serum phosphorus (estimated by the Briggs-Bell-Doisy method) increased markedly within ten days. After about one month a difference in behaviour and activity between the two sets of children became quite noticeable, the soft-muscled, flabby, untreated babies contrasting with he playful, energetically kicking treated ones. The rapid rise of the serum phosphorus in the group receiving the irradiated yeast is noteworthy. In a few cases the phosphorus reached a rather high level,

TABLE II.

—	Date.	Untreated controls.			Controls receiving non-irradiated yeast.		
		Rom.	L.L.	Ron.	Wa.	Pa.	Az.
Age (mths.).	—	8	7	5	30	4	5
Weight (kg.).	—	5·0	6·0	4·4	11·0	5·0	3·6
Serum calcium mg. per 100 c.cm.	1/12/29	8·2	10·0	—	—	—	—
	8/12/29	—	—	—	—	10·0	7·5
	11/12/29	8·0	8·2	—	—	—	—
	18/12/29	—	—	—	10·2	9·4	8·0
	21/12/29	7·2	10·0	—	—	—	—
	5/ 1/30	7·5	—	—	—	—	—
	10/ 1/30	—	—	—	11·2	—	8·0
	20/ 1/30	6·7	9·0	10·8	—	—	7·4
Serum phosphorus mg. per 100 c.cm.	30/10/29	3·46	3·00	4·50	—	—	—
	20/11/29	3·88	4·01	5·00	—	—	—
	26/11/29	—	—	—	3·71	3·83	4·18
	1/12/29	3·87	3·83	4·50	—	—	—
	8/12/29	—	—	—	3·30	3·82	4·45
	11/12/29	4·39	3·78	4·41	—	—	—
	18/12/29	—	—	—	3·11	3·10	4·50
	21/12/29	4·15	3·14	3·91	—	—	—
	28/12/29	—	—	—	2·90	3·64	4·18
	5/ 1/30	3·40	3·09	3·12	—	—	—
	10/ 1/30	—	—	—	3·27	3·46	4·14
	20/ 1/30	3·70	3·00	3·68	—	3·52	3·65
Craniotabes.	20/11/29	+	+	+		+	
	3/12/29	+	+	+			
	20/12/29	+	+	+ +		+ +	+
	16/ 1/30	+	+	+ + +		+ + +	+
Radiograms.	6/11/29	Rick.	Rick.	Normal.	—	—	—
	24/11/29	,,	Worse.	Mild rick.	{ Very sev. rick.; enlarged epiphyses; bow-legs; deformity of thorax.	—	—
	1/12/29	—	—	—		Sl. rick.	Rick.
	25/12/29	Def. rick.	Sev. rick.	Worse.		—	—
	31/12/29	—	—	—		Def. rick.	—
	11/ 1/30	Def. rick.	Sev. rick.	Sev. rick.	—	—	—
	15/ 1/30	—	—	—	Heal.*	Worse.	Def. rick.

* Transferred to irradiated yeast on Dec. 31st.

but no untoward symptoms whatever were associated with this rise. The serum calcium was regularly estimated (by the Clark-Collip modification of the Kramer-Tisdall method). It remained quite normal throughout the experiment in the group of treated infants, though it was low in some of the controls. Routine examination of the urine disclosed a perfectly normal picture. There are no noteworthy differences in the weight increments of the two sets of children. We did not notice the temporary growth stimulus reported by Hess after administration of autolysed or irradiated yeast to infants. Our dosage (0·75 g. daily) is based on the amounts given by Hess and also on a rough calculation of the possible activity of the yeast. It seems to be adequate. We are studying now the effects of higher and lower concentrations.

A commercial preparation of irradiated yeast has lately been widely advertised in America, the hope being expressed that with the addition of the antirachitic vitamin D this particular brand of yeast "will play an increasingly important part in the American dietary." We doubt whether the inclusion of such a potent preparation in the daily menu would be wise or advisable. The recent work on hypervitaminosis, and especially the important findings of Jundell,[6] should sound a serious warning against the indiscriminate use of irradiated preparations and foods by the general public. Antirachitic medication and prophylaxis must be left in the hands of physicians.

Summary.

The daily administration of 0·75 g. of irradiated yeast to rachitic infants brings about a disappearance of the symptoms in the course of six to eight weeks.

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THE MECHANISM OF A MEASLES EPIDEMIC.

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EVERY alternate year the educational and health authorities of London prepare to receive the attack of measles, destined to make about one hundred thousand children miserable, to say nothing of their parents, to kill more than a thousand of them, and to leave many more with health impaired for life. In facing this periodic attack there is brought into play a great deal of administrative machinery, without, it is to be feared, producing any sensible effect on the course of these epidemics, though certainly ameliorating their toll of mortality and crippling disease. It is a little puzzling that we are content to gaze upon this spectacle, which has been going on not only in London but in every large city for centuries, without troubling very much about its cause, whereas mathematicians readily devote their lives to working out with the utmost precision the causes which determine the periodic return of planets and comets, which do not seem to have any remarkable relation to our happiness, interesting though they are.

The solution of problems such as the causation of epidemics are left to a few underpaid and overworked research workers who have ideas as to how the problems might be solved but neither funds nor adequate assistance by which to even collect the available information. Much, indeed, of the desired information is found not to be available, since the notification records, secured at considerable public expense, are considered to have served their purpose when the necessary administrative action has been taken, and have been sent to the destructor. This is not surprising, because the medical officers in our public health services certainly have no time for prolonged and arduous researches into such matters. And so these epidemics come and go with monotonous regularity whilst every ten or twenty years some research worker in vital statistics finds time to take up the problem where a predecessor had been compelled to leave it, and advances matters one stage further towards the desired solution. Such is our English method of "muddling through."

Cause of Periodicity.

In a paper published in October, 1928,[1] I showed from analysis of the records* of some 10,000 measles cases and their contacts in St. Pancras, that immunity to measles can only be acquired by an attack of the disease, the periodic changes which actually occurred in the proportion of children not immune in that sense in the total population at different ages during the years 1924–28 were much too small in amplitude to account for the epidemic phenomena during those years.

In the upper portion of Fig. 1 (which is a modification of Figs. 4A, 4B, and 5 in the paper referred to) the fluctuations in the actual total numbers of children under 10 who had become insusceptible owing to a previous notified attack are shown. As an example of the amount of fluctuation which really occurs I may quote the conclusion that at the pre-school ages 2, 3, and 4 the 1926 epidemic brought down the percentage of children at risk from 86 to 76, at the infant school ages 5 and 6 from 71 to 61 per cent., and for all children under 10 from 74 to 67 per cent., or in actual populations from 26,500 to 24,000 out of 36,000 in all.[2] Allowance for the fact that all these figures are slightly too high, owing to 10 to 15 per cent. of cases probably escaping notification, does not appreciably affect the conclusion that the amplitude of these fluctuations, which has usually been assumed to be sufficient to account for the biennial periodicity of measles eqipemics, in actual fact does not suffice to explain this. A rapid calculation from Fig. 4 leads to the conclusion that about 21 per cent. of all children of the school ages 5–13 would be at risk to measles at the start of an epidemic and about 18½ per cent. at the end of it.

If, however, we could suppose that, as for diphtheria, each measles case was accompanied by several latent cases but that the latent immunity so produced gradually disappeared after the epidemic, as Gill has shown to occur in malaria, taking about two years instead of five years to disappear, then the amplitude of these immunity waves might be increased 3, 4, or 5 fold and we should have a more reasonable explanation, not only why the epidemic comes to an end but why it fails to occur in the next year when the seasonal conditions are favourable and there are plenty of children available who have not had the disease†

Suggestions of Latent Immunisation.

I was not aware that any previous suggestion of a latent immunisation in measles had been made when I produced evidence in favour of it in the paper referred to, but I find that as early as 1913 Butler, in a remarkably able paper on measles to the Epidemiological Section of the Royal Society of Medicine,[4] suggested, though he was not able to prove it, that "not age, per se, but the opportunity which it confers of acquiring an active immunity through exposure to attenuated or minor doses of infection brings about the changes in susceptibility

* Made available for research through the kind coöperation of the Medical Officer of Health, Dr. G. Sowden.

† According to the calculation in St. Pancras, in November, 1926, 51·6 per cent. of children aged 5 to 10 had not had measles as compared with 53·8 per cent. in December, 1925, when a large epidemic followed.

exhibited...” Dudley[5] called attention again to this statement of Butler's in a paper read to the same section a year ago, and pointed out the similarity between the Willesden curve of incidence amongst

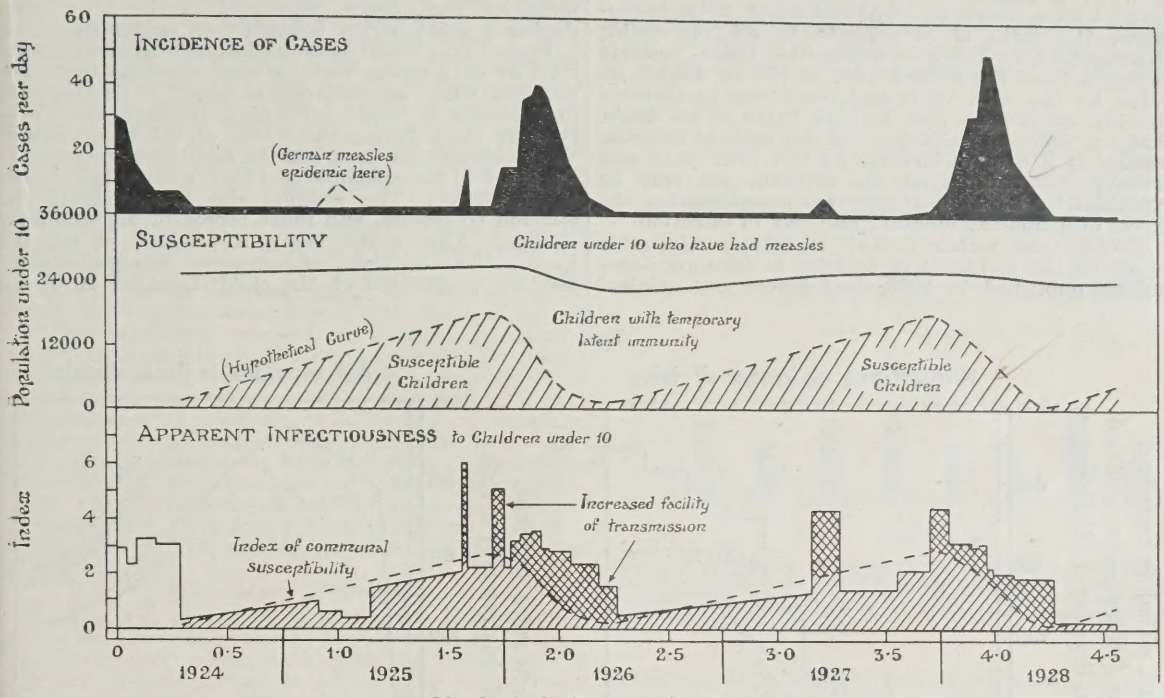


FIG. 1.

Measles in St. Pancras, 1924–28.

show so well the rapid loss of congenital immunity during the first year. The maximal age in the St. Pancras curve is not attained until two years later than in the Willesden curve, but the maximum reached

contacts and the immunity curve in diphtheria according to the Schick test.

In Fig. 2 I have brought together on the same diagrams curves constructed (A) from Butler's series of histories of measles in Willesden school-children, and (B) from the St. Pancras notification data. The left hand portion of the figure shows the percentages of children who had at some time passed through a clinical attack at successive years of age up to ten and indicates a similar trend in both, but somewhat lower percentages throughout in St. Pancras, owing to notification being not quite complete, and Butler's data being restricted to public elementary school-children. The curve B (1) represents the condition of affairs at the start of the 1926 epidemic, B (2) a year later, and B (3) a year previously, when no epidemics followed, and the difference between these is clearly too small and inconstant to determine the occurrence or non-occurrence of epidemics in alternate years. The right hand portion of the figure compares (A) the attack-rates at each age in Willesden during 1908–11 among the children still at risk living in the same house as a case, with (B (4)) the same in St. Pancras during the 1926 epidemic, and at the foot we have (B (5)) the attack-rates during the same epidemic in the whole population at risk in St. Pancras. The apparent difference between the upper curves in the first year of life is merely due to Butler having subdivided this age-group into two halves, whilst my point represents the whole year, and does not

is practically the same, about 90 per cent. To produce this effect on the curve and thus reduce the mortality has certainly been the aim of public health authorities in recent years, but much as I would like to attribute the difference to these efforts, it must be admitted that it may perhaps be due to other causes such as different housing conditions and degrees of over-crowding in the areas compared. A comparison of the B (4) and B (5) curves shows that in the second and third years of life the expectation for a child who has not had it of catching measles during an epidemic is increased six-fold if a case occurs in the same house, or at ages 4, 5, or 6 it is increased five-fold. The percentage attack-rates in the 1926 epidemic were as given in Table I.

The chance of infection among contacts living in the same house cannot be much affected by school attendance, at any rate up to the eighth year, since contacts are kept at home from school in any event, and the B (4) rates may therefore be taken as units for the measurement of immunity at each age, and the B (5) rates in all children at risk expressed in terms of these units should indicate how the expectation of catching measles from any source whatever changes with advancing life. It appears that this ratio increases up to age 4, as would be expected from the ever-increasing range of movement of the child, but strange to say it remains steady from 4 to 6, and then falls off, so the expected increase in risk at age 5 does not appear, and I think that

TABLE I.

Age-group	0–	1–	2–	3–	4–	5–	6–	7–	8–	9–
Contacts at risk (B4)	59·0	75·5	73·1	80·5	88·4	91·9	82·1	75·3	61·4	56·2
All children at risk (B5).. ..	8·5	12·1	12·9	15·0	17·7	18·8	16·7	6·5	2·9	1·5
Ratio of B5 to B4	0·144	0·160	0·177	0·186	0·200	0·205	0·204	0·086	0·047	0·026

Butler was well justified in giving a hesitating support to his statement that "delaying the age of commencing attendance at school would probably raise to a higher age the proportional incidence of measles." In whooping-cough, in which disease, as I hope to show in a paper shortly to be published, latent immunisation seems to be absent or of little importance, the ratio of attack-rate in all susceptible children to attack-rate in susceptible home contacts increases from the second year of life to double its value by the fifth year, and continues to increase steadily afterwards, and I think there is no doubt that the different behaviour of the ratio in measles, ceasing as it does to increase by the fifth year and actually decreasing after the seventh, can only be explained by latent immunisation counteracting the effects of increasing mobility and risk of infection.

Having read rather hastily Halliday's admirable report on the incidence of measles in Glasgow tenements[6] published in 1928, just before my original paper went to press, I omitted to notice this interesting suggestion on page 18,

"in spite of the fact that in March the tenements still contained 49 children who had not had measles, only one further case of measles occurred. This fact may have been related to the chance of exposure. On the other hand, it suggests the possibility that during the progress of the main outbreak the presumably susceptible children who did not develop measles were exposed at intervals to small doses of the virus, and thus developed a degree of immunity.... In these circumstances, however, such an immunity would be temporary and partial, as the vast majority of individuals are destined sooner or later to undergo an attack of the disease....."

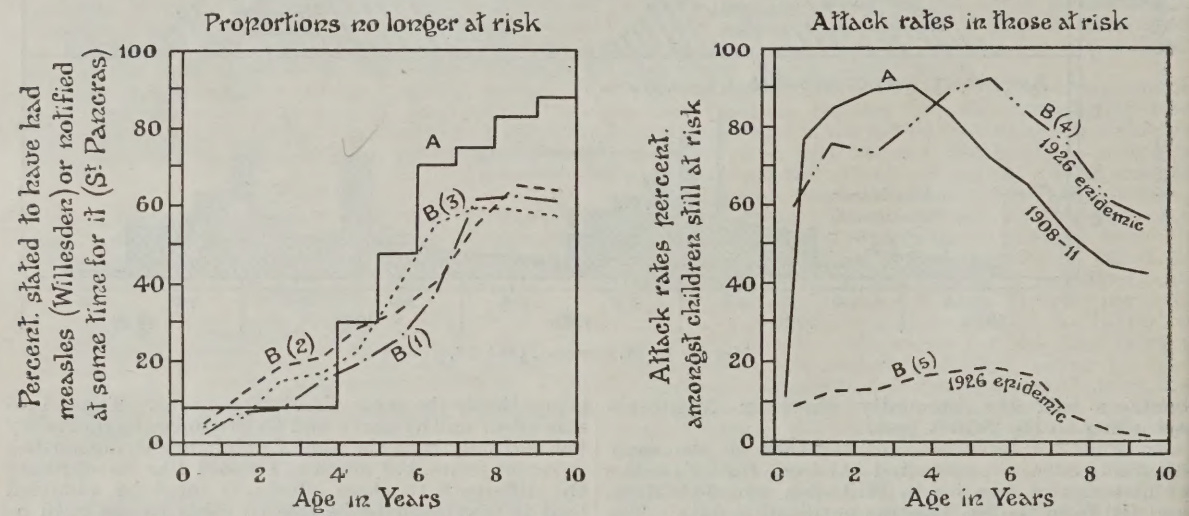
Apparent Infectiousness.

Here we had a suggestion of that *temporary* latent immunisation in measles for which I produced some statistical evidence, to be further amplified in the present communication. Briefly, the evidence for this so far obtained depends upon (*a*) the behaviour of the index of apparent infectiousness between epidemics, and (*b*) a study of the subsequent behaviour of children who were contacts to a case of measles in their homes as compared with that of control groups. The *index of apparent infectiousness* for measles is defined in this way. If n cases of measles occur in any period of time t, and s children under 10 develop the rash in the same house as, and after an interval of 10, 11, 12, or 13 days from the appearance of the rash in, one of the n cases, then the apparent infectiousness during period t is measured by the ratio $p=s/n$; and if q be the ratio during a post-epidemic period of low incidence, then the index of apparent infectiousness is p/q. That is to say, it is the chance of one case being followed by another in the same house under standard conditions of exposure, in terms of the chance, measured in the same way, during a quiet period following an epidemic.

From Fig. 1 it will be seen that, instead of remaining level or only rising with extreme slowness up to the moment when an epidemic is about to begin, as I find occurs in other infectious diseases, the index steadily rises during the whole of the non-epidemic year, culminating in a sudden additional increase at the start of the epidemic and then a rapid fall during the epidemic. The gradual rise has evidently no relation to season, and must represent an immunity change. This index being a product of what I have called the *index of communal susceptibility* (or relative proportion of the children under 10 in the population who remain susceptible at the middle of the period), on the one hand, and the *index of true infectiousness* (or relative danger *for a susceptible child* of catching the disease if exposed to a case under standard conditions during the period), I have shown by the dotted line and shaded portions what are probably the relative parts played by these two factors. The hypothetical curve of communal susceptibility is derived from the changes which occurred in the population of susceptible children under 10 on the assumption of a latent immunisation of about four children to each clinical case and a subsequent loss of that immunity at a rate, suggested by other evidence, which would cause it to disappear in about two and a half years. The portions of the index above the dotted curve are in that case attributable to increased facility of transmission of the virus from person to person, and this at first sight appears to remain enhanced throughout the epidemic, but, as I shall show presently, this is only because we are dealing with a large area and looking at a composite picture for the whole of St. Pancras, for when analysis into small areas of a quarter of a square mile is made, it is found that as the epidemic successively invades these squares the index rises violently in each, and then subsides to a low level within about six weeks.

In my original paper I was puzzled by the absence of any rise in the index during what appeared to be a small epidemic in 1925, and after pointing out

FIG. 2.



B (1) December, 1925, at start of epidemic.
B (2) November, 1926, no epidemic following.
B (3) November, 1924, ,, ,,
A, B (4) } Amongst susceptible children in same house as a case.
B (5) In whole susceptible population.

Susceptibility to measles in London. A = Willesden elementary school-children (1911. Butler). B = St. Pancras total child population (1924–26).

that the age distribution of cases in this outbreak was different from that of the two major epidemics, I stated on p. 398, "during two minor outbreaks in pre-epidemic periods the apparent infectiousness was temporarily greatly enhanced, but in another extra epidemic which chiefly attacked older children this was not the case." Not having touched the notification data of German measles when I wrote that, I failed to perceive that this extra epidemic almost certainly consisted partly, perhaps entirely, of German measles cases wrongly diagnosed, for a large epidemic of that disease was occurring at that time, the next being in 1929. This little epidemic of measles notifications seemed to constitute an exception to the rule that the index of apparent infectiousness must rise for an epidemic to occur, but it now appears that it is just the exception which proves the rule. It will be seen from Table II. that the definition of 10–13 days inclusive as the most suitable interval between cases for calculating the index for measles brings in about one-half of all possible intervals, whereas in German measles it would only bring in about one-fourth owing to greater variability of the incubation period, a fraction which would be further reduced on account of the higher age-incidence of German measles, and it therefore follows that any considerable admixture with cases of German measles must have the effect of depressing the index of infectiousness as defined for measles. When the German measles notifications are studied independently it is found that there was in fact a pronounced rise of infectiousness in this epidemic as in others.

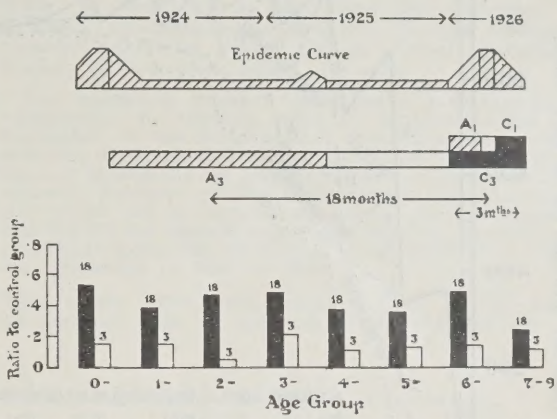
After-history of Contacts.

In Fig. 3 is shown in diagrammatic fashion some of the evidence for temporary immunisation obtained by following up contacts through the 1926 epidemic and this indicates that at all ages up to 10 years children who were intimately exposed to infection but escaped immediate attack were after three months subject to about one-eighth of the attack-rate of a control group, but after 18 months had elapsed they were subject to nearly half that of the control group. The relative values of these fractions suggested a disappearance of latent immunity at such a rate as to be complete after about two and a half years. I have recently sought for further confirmation of this finding by taking out from the records of contacts 304 children aged 1–9 who had never had measles up to the end of 1927 and who had been exposed to infection from a case in the same house during the period March, same extent as for the contacts, so we cannot measure the rate of decline from the size of this ratio alone, but as far as it goes it confirms the conclusions previously drawn.

Process of Immunisation.

In Fig. 4 an attempt has been made to show graphically what would happen to two groups of 1000 children each, (A) born simultaneously at the start

FIG. 3.



Evidence for latent immunisation in measles. Attack-rate during period C in children under ten who had never had measles but had been exposed to infection from a case in the same house during period A, in terms of expected attack-rate during the same period C.

of an epidemic, and (B) born simultaneously at the end of an epidemic, on the following assumptions: (1) that an epidemic recurred every two years, three-quarters of all cases in the two years occurring in the epidemic six months and one-quarter in the remaining 18 months; (2) that children fell victims to measles in successive two-year periods at the smoothed rates for each age obtained by Collins in his recent analysis of measles histories[7]; (3) that latent immunes were produced at the rate of three to each case; and (4) that this latent immunity was lost at the uniform rate of 50 per cent. in one year and 100 per cent. in two years. The lower curves in the left-hand portion of the figure show the increase

TABLE II.—*Distribution of Intervals between Pairs of Cases in the Same House in St. Pancras, 1924–28.*

No. of days interval between onset of rash	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Measles	96	90	99	173	206	318	353	329	269	205	153	104	70	48	38	35	*	*	*	*	*
German measles ..	—	4	6	—	2	2	3	7	6	8	5	8	4	6	3	1	4	—	1	1	—

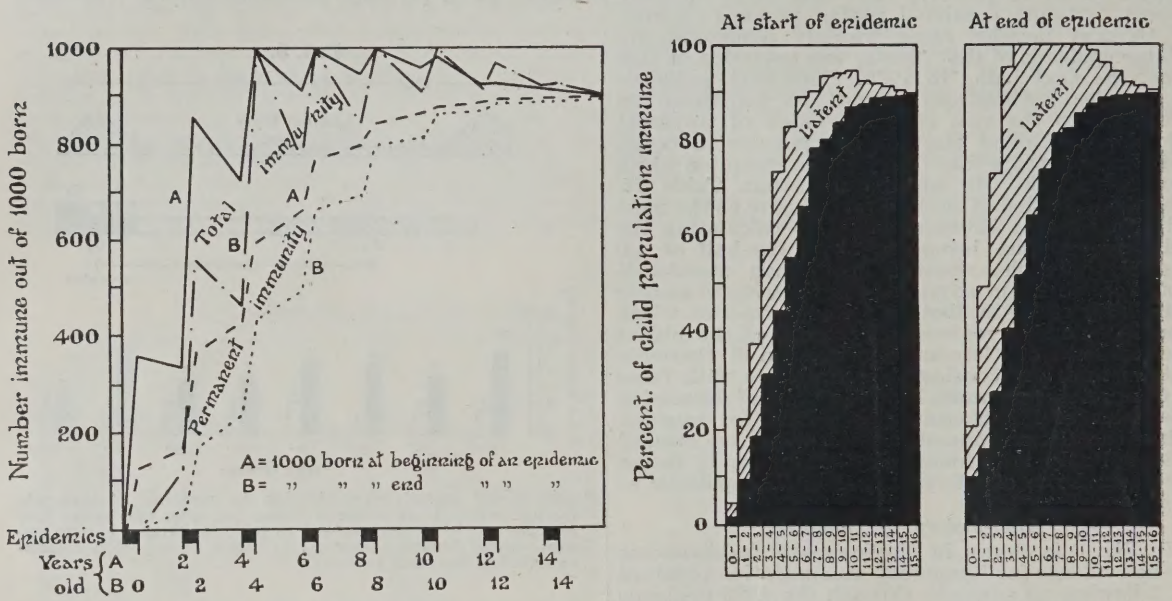
* Not analysed.

1926, to July, 1927, and following them through the epidemic of 1928. By correcting their ages to the beginning of 1928, allowing for removals in the interval as estimated from changes in the electoral registers and applying the case rates per 1000 children at risk in St. Pancras at each age, the expected attacks during each month of the 1928 epidemic were calculated and compared with the actual attacks. The numbers were not large enough for any detailed analysis, but for the whole group with a mean interval of 19 months between previous exposure as a contact and exposure to risk in the epidemic the actual cases were 28, giving an attack-rate per 100 of 9·21 ± 1·11 as compared with an expected rate of 14·56. There is a significant difference here and the ratio of actual to expected attacks was 0·63 after 19 months. It must be remembered that the expected attack-rate would also be reduced by residual latent immunity in the population as a whole, though not to the in communal immunity due to attack, which would not proceed along a uniform curve but in a wavy manner. The upper curves, showing total immunity permanent and latent, indicate that by the end of the fourth year of life practically all the children would be rendered immune by an epidemic, of whom 10 to 20 per cent. would lose their immunity again before the next occurred. The oscillations due to gain and loss of immunity get smaller and smaller, and by the fifteenth year it must be assumed that about 10 per cent. have either passed out of reach of measles infection, acquired a fairly permanent immunity by repeated inoculation, or have had some immunity since birth of a permanent character.

If we now suppose the children born uniformly over the two years instead of instantaneously at two points, we obtain the distributions in the right hand portions of Fig. 4, which show the changes which occur on this basis in the permanent and latent

immunity of children of each age-group in the population from the start to the end of an average epidemic, the available susceptible material for the disease to work upon being indicated by the white unshaded area. It appears that, if the assumptions are approximately correct, almost complete immunisation of the more mobile portion of the child population (that is to say ages 3 and upwards) is produced before the epidemic stops, leaving only very young children unprotected, doubtless those who are not associated much with older children and have therefore escaped coming into contact with sources of infection. At the start of an epidemic the proportion unprotected amongst those who have not had measles would be about 75 per cent. at age 2, falling to about 40 per cent. at ages 5–7. It may seem that this latter figure is incompatible with the 80 or 90 per cent. attack-rate among such children in houses where a case occurs (see Fig. 2), but it must be remembered that the 40 per cent. is an average rate through the population, and since measles will have a greater chance of gaining entrance to households containing a small proportion of latent immunes than to households containing a large proportion of latent immunes, the attack-rate within such households may be expected to be higher.

FIG. 4.



Process of immunisation to measles of children in an urban area, exposed to biennial epidemics, supposing that (1) each clinical case is accompanied by 3 latent cases; (2) latent immunity decreases at a uniform rate to zero in two years.

Progress of Epidemic in Space.

In Fig. 5 I have represented the progress of the 1926 epidemic through St. Pancras by dealing separately with areas half a mile square, as used in Bartholomew's atlas. The key map to the left of the diagram shows also the artificial barriers formed by extensive railway depôts and sidings across which there are no communicating streets, and which have therefore an important influence in determining the directions of spread in this area. The epidemic first appeared in the north-east corner, square F 16 indicated by the figure (1), heralded by a sudden rise in apparent infectiousness at the beginning of December, the index rapidly descending to normal by the beginning of January and the incidence curve (cases arising every ten days) following about three weeks behind. It next spread to the adjoining squares F 15 and G 15, for which there is a double peak, owing to railway sidings dividing the area and preventing spread in a westerly direction; in the easterly portion, denoted by the figure (2), infectiousness rose in mid-December and incidence began to rise early in January. The invading wave then spread southwards; infectiousness rose in square G 16 at the beginning of January and in H 16 in mid-January, and then moving westwards the epidemic reached square H 15, where the index rose to 12 about the beginning of March, and case incidence began to rise some two weeks later. Whilst this was going on, another salient was advancing from the south-east corner (4), where the index rose at the end of December, through the district bounded by the Euston and King's Cross railway barriers 5 (b), and then joining with the other stream. Last of all the districts (7) and (8) which had escaped owing to the peculiar distribution of barriers and absence of sufficient cross communication were affected by a rise of infectiousness in the latter half of March and beginning of April respectively.

No doubt the mapping out of school attendance areas in relation to these barriers plays an important part in determining these definite streams of flow. The squares F 16 and H 15 present perhaps the best examples of the unhampered progress of a measles epidemic over a limited area of streets, and we see that under such circumstances the epidemic lasts 6–8 weeks and is immediately preceded by a sudden increase in apparent infectiousness to about 10 or 15 times its post-epidemic level. The apparent infectiousness then steadily declines with increasing communal immunity in the affected area to a low level in about six weeks, whilst the case incidence is steadily rising, so that at the peak of the epidemic wave the index of apparent infectiousness has got down to about three or four.

Why an Epidemic Starts.

Before I made this analysis I expressed the view in my paper on measles that the sudden rise at the start of an epidemic was due to an increase in the facility of transmission of the virus from child to child, probably brought about by atmospheric temperature, pressure, humidity, and so forth reaching a state specially favourable to transmission, the immunity barrier being also down. This analysis proves that atmospheric conditions cannot be of prime importance in determining the moment of onset, since we cannot suppose that these conditions

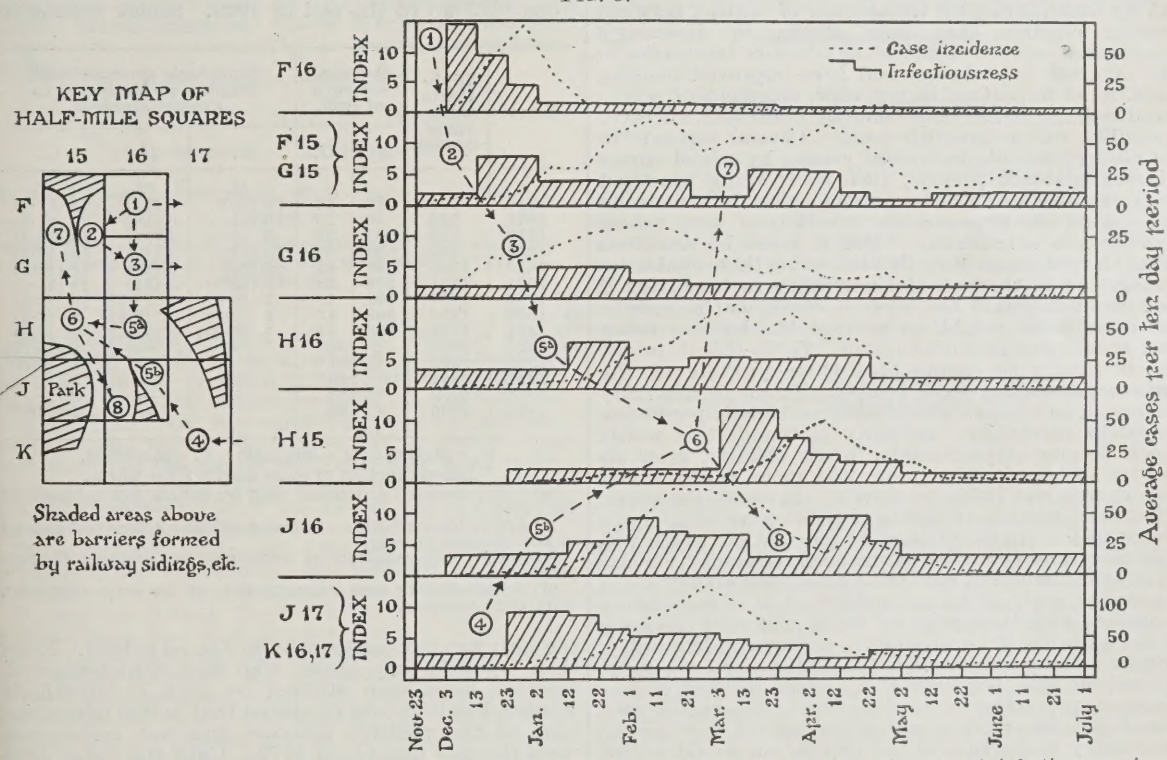
were so different in Chalk Farm (H 15) and Tufnell Park (F 16) that the epidemic started 12 weeks later in the one than the other. The sudden increase in apparent infectiousness must, I think, take place when the activity of the virus, certainly aided to some extent by seasonal influences, rises to a level P, and the latent immunity of the mobile portion of the young children in the area has sunk to a level L, such that the balance between P, L, the density of population D, and the amount of circulation in schools and streets C, swings past a critical point in favour of the virus.

It is just as though we kept on day after day inoculating a bacterium into a liquid culture medium to which some essential constituent, x, lacking to start with, is also being daily added in successive small quantities. No growth at all will occur until a critical concentration of x has been reached, and then rapid growth will suddenly commence. This, I think, is the best explanation of the sudden rise of true infectiousness which precedes the onset of an epidemic in most diseases I have studied, and in saying this I admit it is nothing but Gill's "quantum" theory stated in such a way as to make it rather easier to visualise. The culture medium for an epidemic is the non-immune human population, and free multiplication of the virus is only possible when density or circulation or immunity level of the population may delay or prevent its further advance, in which case that area may escape until later when the infection pressure coming from some other direction is greater or the immunity level has fallen lower so that the balance is then upset—or it may escape altogether, owing to the season having advanced too far, until the next year or the next epidemic. This, I think, is the mechanism of spread of a measles epidemic through an urban community and it fits in well with some interesting observations made by Halliday in the discussion following a brilliant mathematical exposition of the Glasgow measles curve by Soper[8] to the Royal Statistical Society in December, 1928. He said,

"Now, measles as outbreak takes time to move through a community. In Glasgow, when an outbreak began in September, it was found that it took 24 weeks to pass over the 37 sections or wards of the city. On the other hand, if measles did not begin in the form of outbreak until January, February or March, it followed that the whole city would not be covered until June, July or August. But this did not happen because, owing to the interposition of another factor, the progression of the outbreak in space was frustrated in May or June."

This other factor was seasonal, and it followed, he showed, that an epidemic which started late in

FIG. 5.



A measles epidemic in space and time (St. Pancras, 1926): case-incidence and indices of apparent infectiousness in half-mile squares.

the "concentrations" produced by the factors L, C, and D reach a favourable level, and if this happens at a time when seasonal conditions are also favourable, multiplication is suddenly stimulated and facility of transmission increased. Once the balance is upset in this way the epidemic goes forward in the immediate nieghbourhood, which means for a large area just behind the advancing edge of the wave, until practically all the children aged 3 and upwards are rendered temporarily or permanently immune, leaving unprotected only a proportion of very young children who have been sheltered by circumstances from infection. The wave thus spreads outwards until it reaches an area where changes in a large city might leave large tracts of the city untouched and another epidemic might therefore follow in the next year, whereas in smaller towns such as Greenock and Dundee this would not occur, and a regular biennial periodicity was there the rule.

This problem has, of course, been studied some 12 years ago by Brownlee,[9] and it has been suggested that I dismissed his conclusions in somewhat cavalier fashion in my original paper,[10] but my reason for only making brief reference therein to his well-known work was that, whilst I saw that the interesting facts he brought to light by periodogram analysis—for example, that there were distinct periods of 97 and 87 days observable in the recurrence of measles

epidemics in different parts of London, might have an entirely different explanation than the one he gave for them (biological cycles of development of distinct strains of the virus), I had then no data which would enable me to make more than a speculative suggestion about this. I think, however, that the method used in Fig. 5 may enable us to settle this question when we have been able to make a similar analysis of several successive epidemics in the same area, and in the meantime I will only point out that the facts already brought out in Fig. 5 alone—for example, the mere fact that the sudden rise in infectiousness which was the starting point of the epidemic occurred 12 weeks later in square H 15 than in F 16, seem to make it most difficult to accept the explanation Brownlee gave. At the same time they supply grounds for believing that a more interesting reason than the one he propounded will be found for the phenomena which his work brought to light.

Conclusion.

In conclusion we may ask, how does this help us to prevent epidemics of measles? Let us glance one by one at the factors which seem to be involved in the upset of balance which starts the epidemic. The activity of the virus P is beyond our control, and so is the march of the seasons, and the density of population D is a matter which can only be slightly and gradually improved. The circulation C, by which is implied the amount of contact between young children, has been shown by Halliday's researches on the conditions in Glasgow tenements to be of great importance, and here improved housing and, most important in my view, independent access to dwellings rather than common staircases wherever possible, can accomplish much. Careful supervision of nursery schools and infant classes by school nurses during epidemic periods, such as is being practised in some areas of London, should also do something to reduce the exposure to infection of very young children to a minimum. But it must be admitted that the only hope of really preventing these epidemics altogether is through the immunity factor L, for if we could maintain the level of communal immunity at a sufficient height to prevent the balance being upset no epidemics need occur. To do this it might be necessary to ensure that three-quarters of the whole population were temporarily or permanently immune, and unless a method of artificially producing a fairly permanent immunity is found, this would soon become impracticable, for as children grew up under such protection more and more adults would be at risk and liable to attack. It seems, therefore, that as a matter of practical politics we must hope for either a simple method of inoculation which will produce a more or less permanent immunity, or else a simple method of rendering an attack abortive and harmless, such as the proposed method of inoculating contacts with their parents' blood, whilst at the same time allowing it to produce a permanent immunity. From many points of view the latter seems the most promising line, for, even if a certain method of permanent protection were discovered, experience with small-pox vaccination makes it doubtful whether the necessary proportion of the population would accept such protection. It may well be that further knowledge of the march of events which take place as the epidemic wave front approaches a district may enable us, without ever having isolated the virus, to so choose our time in applying some simple method of partial and temporary protection as to allow the wave to immunise most of the children for us without the distressing features, mortality, and after-effects, which we now have to associate with a measles epidemic.

Towards the accomplishment of this end there is only one way—more research from both aspects, experimental and statistical.

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1. Stocks, P., and Karn, M. N.: A Study of the Epidemiology of Measles, Annals of Eugenics, 1928, iii., Pts. 3 to 4, pp. 361–398.

(*Continued at foot of next column.*)

Clinical and Laboratory Notes.

IMMUNISATION OF A FEVER HOSPITAL STAFF AGAINST DIPHTHERIA.

By E. H. R. Harries, M.D. Lond., D.P.H.,

MEDICAL SUPERINTENDENT, BIRMINGHAM CITY INFECTIOUS DISEASES HOSPITALS.

The Birmingham City Hospital, Little Bromwich, was amongst the earliest of the large fever hospitals to introduce the Schick test and the active immunisation of the positive reactors amongst the staff. The results in the earliest years have been submitted to statistical analysis by Hilda M. Woods,[1] who showed that whereas during the three years immediately preceding the introduction of immunisation the attack-rate was 17·8 amongst an average nursing staff of 90, the rate during the years 1922–24 was 3·7 per annum amongst an average nursing staff of 108. Woods showed that the difference between the attack-rates for the two periods was more than four times the probable error—"a greater difference than would be expected as the result of chance alone."

The purpose of this note is to record the results from 1922 up to the end of 1929. Schick testing of the nursing staff commenced in January, 1922. From then onwards only nurses who were Schick-negative reactors have been allowed to work in diphtheria wards; but it should be stated that active immunisation of the positive reactors was not commenced until the last quarter of 1923. Until the end of 1924 only the nursing staff was Schick tested and immunised. From the beginning of 1925 onwards a similar procedure was adopted for the domestic staff

Year.	Diphtheria admissions (crude).	Average strength of staff.		Diphtheria amongst staff. Number and incidence to average strength.		
		N.	D.	N.	D.	C.
				%	%	%
1916	695	80	40	16 (20)	5 (12)	21 (17·3)
1917	632	66	33	16 (24)	6 (18)	22 (22·2)
1918	725	61	30	6 (9·8)	4 (13)	10 (10·9)
1919	799	64	32	10 (15)	3 (9)	13 (13·5)
1920	1349	98	49	24 (24)	8 (16)	32 (21·8)
1921	1301	108	45	14 (12·9)	5 (11)	19 (13·0)
(*a*) 1922	1090	108	45	7 (6·4)	3 (6·6)	10 (6·7)
(*b*) 1923	1409	108	45	4 (3·7)	4 (8·8)	8 (5·4)
(*c*) 1924	1734	108	45	1 (0·95)	5 (11)	6 (4·0)
(*d*) 1925	2005	C. 130*		—	—	1 (0·76)
1926	2003	C. 131*		—	—	1 (0·76)
1927	1842	C. 130*		—	—	0
1928	1909	C. 162		—	—	0
1929	2106	C. 166		—	—	1 (0·6)

N. = nursing; D. = domestic; C. = combined.

* Reconstruction of some scarlet fever wards.

(*a*) Differentiation of nursing staff by Schick test commenced Jan. 28th.

(*b*) Active immunisation of nurse-positive reactors commenced in last quarter of year.

(*c*) Active immunisation of nurse-positive reactors through year.

(*d*) Schick testing and immunisation of domestic staff also, from 1925 onwards.

[1] Jour. Hyg., 1928, xxviii., 147.

References.

(*Continued from previous column.*)

2. From Table VII., p. 371 of reference No. 1.
3. Gill, C. A.: The Genesis of Epidemics, London, 1928.
4. Proc. Roy. Soc. Med., 1913, vi., 1267.
5. Ibid., 1929, xxii., 575–576.
6. Medical Research Council, Special Report Series No. 120, 1928.
7. Public Health Reports, U.S. P.H. Service, 1929, xliv., No. 14.
8. Journal of Royal Statistical Society, 1929, xcii., 68.
9. Proc. Roy. Soc. Med. (Section of Epidemiology), 1918–19, xii., 77–120.
10. Brit. Med. Jour., 1929, ii., 111.

also, since when no nurse or maid has been allowed to work in a diphtheria ward until known to be Schick negative, whether as the result of active immunisation or not. No Schick-negative reactor has contracted clinical diphtheria. The above Table sets out the main facts. The *average* yearly strength of the nursing and domestic staffs is given.

It is clear that the average strength does not represent the real number of persons at risk in any year. Changes amongst the members of both staffs result in a varying number of fresh non-immunes being at risk for short periods in each year. For example, in 1929, there were 129 nursing and domestic new entrants of whom 41 (31·7 per cent.) were Schick-positive reactors. In the Table is also shown the crude number of cases admitted to the hospital with a diagnosis of diphtheria in each year. This figure includes all cases of so-called bacteriological diphtheria and all cases in which the diagnosis was revised to some other condition. The number of cases of true clinical diphtheria admitted in each year was from 21 per cent. to 33 per cent. (1929) less than these crude totals.

The immunising mixture first used was toxin-antitoxin (T.A.T.), later toxoid-antitoxin (T.A.M.), or modified toxin (M.T.), and during part of 1928 and throughout 1929 toxoid-antitoxin floccules (T.A.F.). So far as our experience has gone with the last-named preparation, it would appear to be superior in immunising value to any of its forerunners—i.e., in rapidity of immunisation. Its use in the immunisation of adults has been attended by a notable freedom from reactions.

THE FŒTAL HEART BEAT.

AN OBSTETRICAL EXPERIMENT.

By C. Russell Corfield, M.D. Brux., L.M.S.S.A., D.T.M.,

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An interesting experiment has recently been concluded in the obstetric department of this hospital, the object of the research being: (1) to verify the statement that the maximum point of audibility of the fœtal heart beat is a reliable guide to the ultimate presentation; (2) to determine, if possible, the relationship of the rate of the fœtal heart beat to the sex of the child; and (3) to determine the possibility of a relationship between the age of the mother and the sex of future children.

Three separate groups of a hundred cases each were included in the experiment, and with few exceptions the findings were almost identical in each group.

It was found that the fœtal heart beat in quite normal cases has a wide range, much wider than 130 to 150 with an average of 132, as taught in many text-books; therefore an apparently unduly slow or rapid rate does not necessarily foretell distress or disaster to the child. The average rate lay between 112 and 180 per minute, and on further investigation these rates fell into six distinct and well-marked groups, each with an average age-incidence and sex value.

Group.	Average fœtal heart beat.	Average age-incidence.	Percentage of predominant sex.
1	112 to 120	27·6	66·6 females.
2	121 to 130	28·16	58·3 ,,
3	131 to 140	24·74	51·1 males.
4	141 to 150	28·0	57·1 females.
5	151 to 160	28·85	75·0 ,,
6	161 to 180	35·0	100·0 ,,

This Table suggests that a woman's chance of bearing a son is 2 to 1 against if she falls into groups 1 or 2; this is against the usual teaching that suggests that a low pulse-rate favours the male.

The majority of births fell under group 3 with a fœtal heart beat of 131 to 140, an age-incidence of 24·74, and a sex value of 51·1 in favour of the males. It will be noted that this is the only group where the males predominate. In group 6 were placed the later primiparæ and multiparæ; here we find the highest age, fœtal heart beat, and female sex value 100 per cent.

The following suggestions are gleaned from the results of this small research.

(1) There is no doubt that the position of the maximum audibility of the fœtal heart is a fairly reliable guide to the ultimate presentation of the child; no less than 75 per cent. were found to be correct.

(2) It cannot be said that the fœtal heart beat foretells definitely the sex of the fœtus, but there certainly appears to be a relationship and a fairly well-established range of fœtal heart beats at different ages. The fact that in groups 1, 2, 4, 5, and 6 the predominant sex is female suggests that a fœtal heart beat of 141 to 180 in late primiparæ and multiparæ favours the prognosis of a female child.

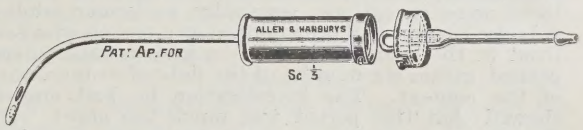
(3) There is no doubt that the chances of a woman having male issue become less as she travels along the child-bearing period. This might be an interesting point in medico-legal argument, and in questions as to the desirability of late marriage.

(4) The experiment suggests that the best age of expectation for male issue is between 24 and 25 years of age.

New Inventions.

A LARYNGEAL MUCUS EXTRACTOR.

I have devised a simple piece of apparatus by which mucus can be extracted by suction from the mouth of the infant without any risk of its reaching the mouth of the operator. A thorough trial has been given to this pattern in the Rotunda Hospital Dublin. It comprises two portions of metal tubing connected by an intermediate chamber, itself divided



into two parts, which can readily be separated for cleaning. Within the upper portion or lid of the chamber is a detachable baffle in the form of a conical disc or dome provided with a U-tube, one end of which passes through the centre of the dome and screws into the suction tube, whilst the other end terminates on the upper surface of the dome which dips into an annular recess in the lower portion of the chamber. The trap thus provided prevents any mucus reaching the chamber from passing up the suction tube.

The instrument is made by Messrs. Allen and Hanburys, Ltd., 48, Wigmore-street, London, W.

Amîn Büktor Rufail, M.R.C.S. Eng., L.R.C.P. Egypt.

Nottingham Hospitals.—Nottingham General Hospital last year admitted 6755 in-patients who cost £2 19*s.* 9*d.* each per week, a slight reduction on the previous year; the average cost per occupied bed was £155 8*s.* 9½*d.* The Hospital Saturday Fund raised over £30,000.—Almost the final act of the Nottingham Board of Guardians was to open recently a new Children's Hospital at Bagthorpe, which has cost £49,000. Accomodation is provided for 56 children under 8 years of age, and an equal number of older ones; another block provides for 42 convalescent children, and there are two isolation wards.—It has been decided to enlarge the Nottingham and Notts Convalescent Homes at Skegness by erecting a new Home for Women at a cost of £15,000. Last year the Homes received 1461 patients.

Medical Societies.

TUBERCULOSIS ASSOCIATION.

ANNUAL CONFERENCE AT OXFORD, APRIL 3RD TO 5TH.

MEMBERS enjoyed the hospitality of Somerville College and the meetings were held in the Pathological Theatre, the chairman being Sir STCLAIR THOMSON, President of the Association.

CONTACTS.

The discussion was opened by Dr. G. JESSEL (Cons. Tub. Officer, Lancs C.C.). The examination of contacts was, he said, not regarded by most tuberculosis officers with any degree of enthusiasm, it being generally felt that the results of contact examination were not commensurate with the labour and time involved. As there appeared to be no available statistics proving or disproving this point, he had recently undertaken an investigation in his area in Lancashire, comprising a population of over 300,000, with the object of discovering how many secondary cases of pulmonary tuberculosis occurred up to the end of 1929 which could be related to cases investigated and accepted as tuberculous by the tuberculosis officers during the years 1921–24 inclusive. Thus in this period there was a minimum period of five and a maximum of nine years for the possible discovery of the secondary or contact case. The results showed that in 15 per cent. of the primary cases accepted as pulmonary tuberculosis there were instances of one or more secondary cases of tuberculosis following. Nearly all these secondary cases were directly related to primary cases which had tubercle bacilli in their sputum, whilst the average interval between the discovery of the primary and secondary cases was three and a half years. There was thus a statistical basis for believing that contact examination at or about the time of the diagnosis of the primary case was usually barren of results, though, of course, there were exceptions, especially in young adults. A house contact had been defined as a person who had lived in the same house with a known tuberculous patient within six months of the date of examination of the contact. The investigation he had quoted showed that this period was much too short. He thought a minimum of four years was desirable, though there were serious practical difficulties in the way of lengthening the period.

Dr. Jessel then went on to quote figures for Lancashire for the four years 1925–28, extracted from the annual reports of the central tuberculosis officer. For the most part the contacts examined were, in reality, suspects, and the figures showed a rate of 74·8 tuberculous per 1000 contacts as compared with a rate of 4·83 tuberculous per 1000 general population. The percentage of tuberculous contacts which had tubercle bacilli in their sputum was 31·7. He also outlined his method of contact examination and emphasised the following points: (1) it was not difficult to pile up large figures by examining all and sundry, and (2) persons in good health readily submitted to examination, and reluctance to be examined was often a suspicious feature of a case.

Although many tuberculosis officers preferred to examine contacts at the dispensary, Dr. Jessel thought there was much to be gained by examination at home. In the past too much attention had been paid to the child contacts and too little to the adults. In conclusion, he believed that the most profitable contact examination work was to be done amongst the families in which a sputum-positive case had occurred. Even here it was most profitable to limit one's energies to genuine suspects. A single negative examination might well lead to a false sense of security, and, if possible, re-examinations should be made at intervals for at least four years. Home examinations should not be neglected and attention should be paid to adults, especially middle-aged contacts. Workroom and office infection should receive also more attention; here welfare workers might help. Dissemination of knowledge in health subjects was important, as were energy, enthusiasm, and tact in overcoming difficulties.

Dr. NOEL BARDSWELL (Princ. Asst. Med. Officer, L.C.C.), on the principle that the tuberculosis officer saw most of the game, stated that he had issued a questionaire to the 30 tuberculosis officers of the London boroughs. The questions and answers he summarised as follows: (1) What steps do you take to ensure the examination of contacts?—The answers stated that with the exception of one borough where a special session was set apart for contacts, the matter of getting up the contacts was largely in the hands of the health visitors. (2) Do you experience much difficulty in securing attendance of contacts?—The answers indicated that there was difficulty especially with the young adults and those who were ailing and did not wish their worst fears to be confirmed. One tuberculosis officer reported that contacts from better-class districts were more willing to attend than were those from poorer districts. (3) What proportion of contacts attending were diagnosed positive on (*a*) first attendance, and (*b*) subsequent visit?—Taking all the figures together the positives were 8·2 per cent., the figure for the whole of England and Wales being 12·7. For children only the positives were 2 per cent., as compared with 6·3 for England and Wales. Figures for the different boroughs showed considerable variation in the number of contacts who were found to have a positive sputum. (4) What proportion of contacts lapsed before a diagnosis was made?—The answer was "very few." (5) To what extent are negative contacts followed up?—The responsibility of keeping in touch with the contact as long as the focus of injection remained was mainly left to the health visitor. (6) Of what value was the school medical service in giving oversight to suspected children?—There were numerous advantages: (*a*) continual supervision, (*b*) provision of country holidays, (*c*) early reference of cases to the tuberculosis officer, (*d*) facilities for treatment of intercurrent illnesses. In conclusion, Dr. Bardswell said that the tuberculosis officers appeared not to be entirely satisfied with contact examination. How far the records of these examinations bore upon the whole question of infectivity he was not prepared to say. If tuberculosis was ubiquitous the important question still remained: Why does it declare itself only in some people?

Dr. W. BURTON WOOD (Cons. Tub. Officer, Essex C.C.) said that nobody would deny the importance of the examination of contacts, but warned his listeners against the danger of catch phrases, half-truths, and the type of administrative control which might confuse the issue. He drew a vivid picture of the harassed mother trying to do her best and bringing her younger children up for examination, but failing to exert pressure on the adolescent son and daughter who were the most likely members of the family to be positive. Statistics were satisfied and the mother greatly relieved because her young children were pronounced healthy, whilst the chief danger was overlooked. For the task in hand adequate time was needed, together with proper clinical assistance without which clinical acumen was smothered in foolscap sheets whose abbreviated designations absorbed the whole alphabet. Sufficient radiograms were also needed but they should be of good quality and not resemble a myope's vision of a November fog. Expense was wholly unjustified unless it yielded an adequate return. In all well-conducted inquiries into contacts there should be three questions: By whom was the patient infected, whom has he infected, whom may he infect? The first question was often insoluble. Even the harmless necessary cow, despite Mrs. Turner's cautionary tale that "cows do no harm," might be to blame. The

examination of child contacts needed the imagination of a poet, the ear of a piano tuner, and the touch of an osteopath, and there were still clinicians who regarded a child's chest as a kind of Abrams box. Without minimising the importance of the fact that occasionally among child contacts a positive case might be found calling for the closest scrutiny, he thought the statistics of children examined and found negative had no value. He stressed the importance of the young adolescent contact, often beginning with a broncho-pneumonic patch in the subclavicular area and rapidly progressing—the true early case of the infected house. All dispensary arrangements as to contacts should be made subservient to the convenience of this type of patient. Influenza, febrile colds, lassitude, slight blood-spitting should be the signal for immediate and searching examination with X ray control, for X rays had proved how slender was the connexion between physical signs and pathology. In his experience it was very rare to find an early adolescent consumptive who had previously belonged to the swarm of children who buzzed like flies round the dispensary malt-and-oil pots. He found it difficult to believe that mere observation, however prolonged and benevolent, could suffice to prevent consumption. We knew little about primary infection and still less about its relationship to frank disease, but we could, by using every modern aid, diagnose pulmonary tuberculosis in its early infiltrative and exudative stages when treatment could be employed with a hope of success.

Discussion.

The CHAIRMAN said he was impressed by the large number of infected contacts, the importance of the radiogram, the number of unknown factors in infectivity, and the value of actuarial control of the statistics.

Dr. G. MACDONALD (Battersea) found that 60–70 per cent. of contacts were uninfected children. A definite standard of positive diagnosis of childhood tuberculosis was needed. At present too much was left to the personal factor of the physician.

Dr. F. J. C. BLACKMORE (Woolwich) thought more figures were required before any useful conclusions could be arrived at.

Dr. MIDGLEY TURNER (Worcestershire) pleaded for a broad view of the contact. He visualised three zones—viz., house contacts, infected factory contacts, casual contacts. In the first zone he had found 191 fatal cases yielded 833 contacts with 11·6 per cent. positive cases.

Dr. J. CROCKET (Glasgow) found 23 per cent. of his patients had a history of contact.

Dr. C. H. C. TOUSSAINT'S (Bermondsey) figure was 16 per cent. He also gave figures showing that in a collection of cases of tuberculous meningitis nearly half proved to have had a tuberculous parent.

Dr. D. J. WILLIAMSON (Ministry of Health) thought that the value of contact examination depended upon the care exercised in selection. Figures given showed that the contact population had a higher percentage of positives than had the general population. Contact examination was valuable also as a routine examination of a section of the whole community.

Dr. E. WARD (Devon) emphasised the value of contact examination in the home as against dispensary examination, and stressed the help of the general practitioner.

Dr. L. S. T. BURRELL (Brompton Hospital) said the older he got the less inclined he felt to place faith in mere physical signs. The gland case in childhood did not become the adult phthisic. The adolescent case was all-important.

Dr. P. ELLMAN (East Ham) said the old age cases were a great source of trouble, they disliked examination, and were careless and unhygienic.

Dr. W. TEMPLETON (West Sussex) laid stress on the risks of engaged couples amongst the young adult cases.

OLEOTHORAX.

Dr. GILBERT (Leysin) gave his seven years' experience of oleothorax, which method of treatment he considered to be a good adjuvant to artificial pneumothorax when used with judgment. With regard to the mode of action of oil injected into the pleural cavity, he considered that at least four practical results were obtainable: (1) disinfectant action in febrile and bacilliferous pleural effusions; (2) the rendering of the pleural layers thick and impermeable; (3) collapse and compression of the lung; (4) the thickening and making rigid of a healthy pleura, thus impeding the displacement of the mediastinum. The therapeutic indications for oleothorax were the treatment of: (1) certain types of pleurisy complicating artificial pneumothorax (especially serofibrinous and puriform effusions which had become chronic, and true purulent effusions); (2) pleuro-pulmonary perforation (e.g., emergency oleothorax for overcoming immediate distress, or for complications when fistulous opening was small); (3) unsuccessful artificial pneumothorax due to insufficient compression (though there were sometimes contraindications when a partial pneumothorax only had been obtained); (4) progressive symphysis pleuræ which was interfering with successful collapse; (5) mediastinal laxity; (6) as an eventual substitute for air when it was essential to avoid frequent refills. The accidents and complications met with were febrile reactions, perforation of lung, too high intrapleural pressure owing to increased secretion of pleural fluid. Dr. Gilbert described two methods of administering the oil: the one, direct, with a 20 c.cm. syringe; the other with a bulb, such as is used for storing antitoxic serum, with a needle attached to one end and a small bellows apparatus to the other, the antitoxin bulb containing the oil being surrounded with a suitable warm-water jacket. The oils used were liquid paraffin and olive oil, the latter with 5 per cent. oil of gomenol added being the best. The oil must be absolutely pure, it must be sterilised before use, and administered warm. Quantities up to 500 c.cm. could be injected according to circumstances and it was advisable to leave above the oil a small area of negative gas pressure, though a complete "blockage oleothorax" was sometimes carried out. When used for fluid replacement the fluid should be evacuated before the oleothorax was attempted.

In conclusion Dr. Gilbert showed an illuminating set of lantern slides.

Discussion.

Mr. H. MORRISTON DAVIES (Ruthin) spoke of the value of oleothorax in the treatment of pyopneumothorax. An intolerant pleura could often be made to acquire tolerance. Oleothorax was often valuable in eliminating the necessity for constant refills.—Dr. H. DE C. WOODCOCK (Leeds) gave his experience of 300 oleothorax operations. It was a cardinal rule never to do an oleothorax before an artificial pneumothorax. He had used the method as a treatment for interlobar and encysted empyemata. He had found it useless, however, for controlling hæmoptysis.—Dr. PETER EDWARDS (Nantwich) raised the question of the difficulty of checking the intrapleural pressure and was puzzled by the divergent views as to the antiseptic powers of gomenol.—Dr. CROCKET emphasised the risk of shock and febrile reactions, and stated that he had found a Woodcock manometer useful for recording pressure.—Dr. E. T. D. FLETCHER then recorded an interesting case.—Dr. NIVEN ROBERTSON suggested the possibility of combining oleothorax with phrenic avulsion.—Dr. S. R. GLOYNE (Victoria Park) gave his experience in performing oleothorax on rabbits.—Dr. SIMMONDS spoke on the absorption of fluid in oleothorax, and Dr. BURTON WOOD raised again the question of difficulties of controlling intrapleural pressure.

TUBERCULOSIS COLONIES.

Dr. J. B. MCDOUGALL (Preston Hall) said that two charges in particular had been lodged against village settlements—viz., that they were expensive and that

they catered only for the few. It was his personal opinion that the delay in the development of village settlements generally had been due to the fact that settlements were assumed to be necessarily expensive and therefore, as far as authorities were concerned, prohibitive. In studying the finance of village settlements conducted on the lines of the Papworth and Preston Hall schemes it was essential to divide the account into three distinct sections—viz., sanatorium, estate, and industries. The subject had then to be considered from the standpoints of capital expenditure and maintenance. In analysing the various returns from settlements he had found it difficult to make comparisons in capital expenditure between one settlement and another because of the different systems employed in presenting the accounts. At Preston Hall the most suitable division of the estimated initial capital expenditure was as follows: Sanatorium section £19,300, estate section £18,670, industries section £1000, to which a further capital sum of £13,654 had been added in the sanatorium section since 1925. On the sanatorium section account, therefore, the total capital expenditure, including the initial valuation, could be put at £32,954, which was approximately £178 per bed, a figure which compared very favourably indeed with other institutions. This relatively low figure was due to the large number of patients housed in hostels and huts. The estimated expenditure on estate section was £48,856. For this sum the Legion could show 121 houses, all, with two exceptions, occupied by ex-patients with their wives and families. The relatively low cost of £403 per house was due to the smallness of the original valuation. These houses, built by capital raised by voluntary subscription, assisted the housing problem of public authorities. Thus, one council had, at present, no less than 27 ex-patients in residence at Preston Hall as settlers and the indirect saving to that particular council was considerable—a point which the critics did not always appreciate. On the remainder of the estate at Preston Hall there had been no capital expenditure beyond £4270 estimated in the original valuation. There was a valuable hidden asset there. When the British Legion assumed control the only department in the industries section which was kept on was the appliance department, the value of which was well covered by £1000. Since 1925 £16,544 had been spent in providing workshops and machinery, bringing the cost of the industries section up to £17,544. They had 145 settlers at Preston Hall, of which 135 were working in three departments of these industries. Dr. McDougall was of opinion that this number could be increased to 140 without additional capital expenditure. The capital expenditure, therefore, to enable each man to become permanently a more or less economic unit was approximately £125—i.e., less than the cost of the treatment of one patient for one year in the majority of sanatoriums in this country—an estimate which he believed would apply to other colonies.

It had been the practice at Preston Hall, Dr. McDougall said, to deal with maintenance under three heads also—sanatorium, estate, and industries. The sanatorium section was obviously in the hands of local authorities who had patients to send them, and the ex-Service men were a diminishing quantity. With these difficulties and a fluctuating bed list there were necessarily fluctuations in the sanatorium balance-sheet. During the past year, however, they had been able to administer the unit and preserve financial balance by charging local authorities £2 12*s.* 6*d.* per patient per week. In 1927–28 there was a profit of £105, in 1928–29 £195. In the estates section the incomes came from rents. Villagers paid from 4*s.* to 9*s.* per week and no rates. Neighbouring farmers rented portions of land. On the expenditure side there were the wages of the settlers on the estate staff, audit charges, &c. No allocation for depreciation had yet been made because the initial valuation of the estate property had been on the conservative side. Probably a reserve fund would ultimately be set up to meet this depreciation. Owing to the growth of the neighbouring town of Maidstone the capital value of the Preston Hall land was appreciating each year. The estate accounts for 1925–29 showed an excess of income over expenditure of £978. If economic rents had been charged the income would have been almost double.

The industries section showed total sales of £198,024 between 1925 and 1929. Salaries, wages, and commission during that period came to £66,160. No interest on capital was debited to the industries account and no portion of the medical director's salary was included. The average loss per annum during the period was £1080—i.e., a loss of 1·8 per cent. on a turnover of £198,024. The average number of settlers on the wage list during these years was 95 and the average loss per annum per settler was therefore £11 7*s.* 4*d.* The results of the present year had convinced him that it would be possible to run the industries at a loss of £10–£15 per settler per annum. The problem of orders and labour was baffling. It would be easy to go into the open labour market and engage hands to catch up with excess orders, but that policy would not stimulate the healthy growth of the settlement. The industries section was only one part of the settlement, and the British Legion had, at Preston Hall, regarded the three sections as one unit. In conclusion, there were many thousands of tuberculous patients receiving more per annum from approved societies and disablement benefit than was necessary as a subsidy to keep them at work as productive units in a settlement.

Dr. E. L. SANDILAND (Barrowmore Hall) emphasised the wastage in life and labour which went on daily by the present method of discharging a patient direct from a sanatorium on to the labour market or the ranks of the unemployed. The ideals of a tuberculosis settlement had been often stated, but could they be put into practice at a reasonable cost? The experiences of Papworth, Preston Hall, and Barrowmore Hall had shown that they could. The latter had come through a rickety youth unsupported by financial vitamins from the Government and now only required an annual premium of public support to ensure its future. It had now 120 sanatorium cases, 12 cottages, and a hostel for ten single settlers. Eight dependents had been employed in the settlement, though none as yet in the industries. Three advanced cases had died 18 months after settlement, being employed for short hours during that period, and five unmarried settlers had left, in some instances to get work elsewhere, in others to get married. There were now 26 settlers on the estate. A table was shown giving the length of time these men had been settled and their periods of invalidity. The industries carried out were woodwork, upholstery, boot repairing, decorating, poultry farming, gardening, and clerical work. Of these 26 settlers, 12 had had tubercle bacilli in their sputum. The amount of time lost through sickness was 2·2 per cent. of the working hours. There was a special fund from which the dependents could be assisted during these short periods of illness. Dr. Sandiland stated that experience had impressed upon him the following facts: (1) tuberculosis settlements have a definite place in any antituberculosis scheme; (2) one colony is sufficient for a large area, if adequately supported; (3) the sanatorium section must be the centre and controlling authority of the whole settlement; (4) all workers must be under continuous medical supervision; (5) the sanatorium section must be kept full in order to have a good supply of possible settlers from which to select; (6) the medical superintendent must have a personal interest in everybody in the settlement; (7) skilled labour is expensive to train, there must be industries which will absorb unskilled labour; (8) settlements should be made by extending existing sanatoriums; (9) they should be of size most suitable to function economically; (10) much depends upon the type of men chosen for the early settlers; (11) although there may be small beginnings

foresight is essential; (12) a study of suitable markets and trades is essential; (13) settlements should be near big centres of population; (14) the financial side must not be fettered by restrictions—a certain amount of floating capital is necessary; (15) a settlement, with its sanatorium, should aim at accepting all types of case.

Discussion.

Dr. BARDSWELL asked why no public authority had undertaken a settlement. One reason was that those authorities had never had the financial position clearly put before them. The finances of the scheme must include the failures as well as the successes, and a large pool of subsidised labour seemed to be necessary to reinforce the trained skilled settlers if success was to be attained. At present public authorities dare not consider schemes which benefited only a small percentage of the tuberculous population needing assistance.

Dr. A. SANDISON (Min. of Pens.) believed that the choosing of medical superintendent and settlers was a highly skilled occupation in itself. He was also impressed with the divergence in figures of losses at different settlements. One difficulty which he foresaw was the automatic blocking of the waiting-list which would naturally occur as time went on.

Dr. EDWARDS agreed that the capital cost of a settlement was too high for any public authority to face nowadays. He also believed that any profits made should be left in the scheme, which a public authority would not do. Patients capable of being reabsorbed into the ordinary life of the outside world should not become settlers.

TREATMENT BY TURTLE VACCINE.

Dr. W. C. FOWLER (Pinewood) said the vaccine consisted of a living culture of an acid-fast bacillus isolated from a sea turtle cultivated by a special method not divulged. It was put up in sealed capsules in three strengths—very weak, weak, and strong. It had to be used within one month of its despatch from the laboratory, and microscopic examination showed the presence of acid-fast bacilli with a marked tendency to clumping. No contaminations were found. The bacilli were only feebly acid-fast as compared with Koch's bacillus and were shorter and thicker. Advanced laryngeal tuberculosis, lupus vulgaris, and meningitis were excluded from treatment by its sponsors. One injection only was required—subcutaneously in the gluteal region—and as a rule no immediate reaction followed. From 14 days to five months later in more than half his cases a small dusky red subcutaneous nodule appeared. The nodule generally remained for several weeks, discharged a slightly turbid serum, and healed as a depressed reddish scar. Pain was present but not severe. He had observed no secondary infection. Of 22 more or less chronic stationary pulmonary cases four had definitely improved, three had slightly improved, one had died of hæmoptysis, two had more slight hæmoptyses, two had developed tuberculous enteritis, and the rest had shown no appreciable change. Of four advanced pulmonary cases two had died and one was very ill. Of ten artificial pneumothorax cases improvement had followed in seven. Of eight early cases two had done remarkably well, four were doing well, and two showed no progress. One case of tuberculous peritonitis with effusion had gone downhill, but after paracentesis had improved.

Dr. G. E. SOLTAU reported that a number of early cases had been treated at Nayland with, on the whole, satisfactory results.

Dr. A. H. LANKESTER reported 44 bone and joint cases treated at Carshalton. Of these, 19 cases proved to be definitely tuberculous; five had much improved after vaccine treatment, eight had slightly improved, three were in statu quo, and three were worse. The remaining 25 were cases in whom subsequent investigation negatived the diagnosis of tuberculosis. They had all much improved.

ROYAL SOCIETY OF MEDICINE.

SECTION OF SURGERY.

AT a meeting of this Section held on April 2nd, Sir HOLBURT WARING, the President, in the chair, a discussion on

AMPUTATIONS AND THEIR RELATION TO THE ARTIFICIAL LIMB

was opened by Mr. C. MAX PAGE. Though amputations were, he said, the oldest branch of surgery, teaching on the subject was largely academic until the Great War forced its practical aspects on the medical profession. The 50,000 amputees in this country had provided a stimulus to both surgeon and limb-maker. He was limiting his remarks to the technique and treatment of amputations in which sepsis was absent, or present only in a subsidiary form. The aims governing the technique of any final major amputation of either upper or lower extremity could be thus stated:—

1. That the stump should provide a lever of sufficient length and power for the attachment of an artificial limb suited to the level of the amputation.
2. That it should be covered closely by healthy, well-nourished skin or scar, both of which should be mobile on the deeper structures.
3. That no part of the stump should be tender on pressure, nor unduly sensitive.

Leg Amputations.

The first question to arise in a given case was what level of bone section would, under the circumstances, give the most useful stump. In the leg, amputations could be considered under the headings (*a*) the Syme, (*b*) the below-knee, (*c*) the above-knee type. The first was essentially an end-bearing stump, and still had popularity, both in practice and as what he might call an examination gambit. During the war the Syme was entirely condemned in septic cases, and it was important to decide how far it was of value in civil work. Those who had seen a number of these cases would agree in condemning it, as a large proportion did not bear the test of time and in any case could only be fitted with a clumsy prosthesis. He had himself seen a good many Syme's stumps giving good service; he had also been called upon to reamputate a number which were painful and of no functional value.

The below-knee amputation gave a most satisfactory stump if 6 or 7 inches of tibia could be left; indeed, control of the knee could be obtained with as little as 4 inches. If more than 7 inches of bone was left, the skin covering was not well nourished, and the stump was practically certain to ulcerate or be the seat of eczema. It was agreed among surgeons that the fibula should be cut 1 inch above the level of the tibial section. In the case of short stumps he thought it a good thing to take the fibula out altogether, as the head of it often caused awkward friction areas when an artificial limb was fitted.

For above-knee amputations, section of the femur 4 to 6 inches above the level of the knee-joint seemed to give the best functional results; amputations done through the knee-joint were clearly undesirable, but in America, Canada, and Germany the Stokes-Gritti was popular. At pensions hospitals the usual experience was that an end-bearing thigh stump gave trouble sooner or later, the ideal stump being one containing 10 to 12 inches of femur, to which an ischial bearing prosthesis was fitted. Amputations of the thigh at a higher level could often control in a satisfactory manner an artificial limb up to a length of 4 inches from the great trochanter. If less bone than this was available, it was better to resect the femur at its neck, leaving the head of the bone in the acetabulum. To this could be more conveniently fitted a tilting table prosthesis than when 2 or 3 inches of femur had been left in.

Arm Amputations.

The question of level could, said Mr. Page, be generalised much as in the lower extremity. The points in the technique in any amputation which seemed to give the best results could usefully be considered in relation to flap-cutting, the bone section, and nerve-end treatment. In this country it seemed to be generally agreed that the end of the bone in an amputation stump should be covered only by skin. Flaps should be so cut that their nutrition and their innervation were as far as possible preserved, and therefore some muscle and fascia should be included in the base of the flap. Clearly, the shorter the flaps the better their nutrition, and in general the skin could be cut as in a circular or elliptical amputation, such short side-cuts being made as were necessary. Long flaps should be avoided. The scar which united the flaps should come on the posterior aspect of the stump in the case of the leg, while in the upper extremity it should be approximately central or terminal. The total length of the flaps designed should not much exceed the diameter of the limb at the level of the bone section. Redundant loose covering of the stump, especially in fat persons, interfered with the successful fitting of a prosthesis.

In cutting through the bone the aim was to prevent spur formation, yet it must be admitted that many stumps showing it were satisfactory. He thought spur formation was due to a tearing up of the periosteum at the time of section, or to the extrusion of marrow containing bone-forming cells. This could be prevented by dividing periosteum half an inch above the proposed line of bone section, and scraping it down the shaft. In that way the saw-cut was made through bone which was denuded of periosteum. Attempts to cover the cut end of the bone with an autogenous or pedicled graft were not much favoured in this country.

Treatment of Cut Nerves.—Drainage.

So far no procedure had given certain promise of preventing the formation of an end-bulb. The nerves which subsequently gave most trouble were those which arose in the smaller cutaneous branches. The stump of the nerve should not be attached to the scar, nor should it lie where it could be pressed on by the prosthesis. He did not think it was satisfactory in practice to pull down the larger nerves and cut them high up; he had seen severe post-operative pain which seemed to have been attributable to the trauma of the nerve trunk. He preferred to crush and cut all recognisable nerves about an inch away from the level of the bone section, following this by the injection of absolute alcohol into its stump. It was important to secure freedom from pain following the operation, the time when the nervous system was most sensitive. Otherwise there might ensue a jactitating stump.

As a general practice he thought it well to carry out drainage for 24 to 48 hours. Hæmatoma in early stages was most undesirable; not only did it interfere with the skin nutrition, it was liable to be followed by a low-grade suppuration.

Finally the views he had enunciated he wished to be regarded as applicable to stumps which were expected to be final in character. The full function of a stump depended on its normal position being maintained during convalescence, and keeping its musculature in good condition. The importance of avoiding post-operative joint contracture was now well recognised, and it was common to use early temporary pylons.

Discussion.

Mr. P. J. VERRALL said that coöperation between operator and limb-fitter was of the first importance. It was so at Roehampton. The Syme amputation was admirably suited to the native in the East, for he had no opportunity of wearing an artificial limb. In Europe, where artificial limb-making was so good, it was found that after six or seven years a Syme began to go wrong; the lower part divided posteriorly or to one side. The level at which bone was divided and flaps made was determined largely by the scar. He did not like a posterior scar in a below-knee amputation; he had always used a postero-external flap. He felt contempt for spurs. Periosteum he divided on a level with the bone. Though for a long time he carried out drainage in amputation cases, for a year he had given it up. If he felt in doubt about a case, he stitched muscle with interrupted suture, especially in thigh stumps, but not closely. Splinting of the knee for below-knee amputations was important. No dressing was done until the fourth day. No hæmatoma was ever stopped by putting in a tube; it was rarely necessary to evacuate; a small hæmatoma was usually absorbed.

He insisted on the importance of remaining in bed for three weeks after amputation. He treated nerve-ends similarly to Mr. Page; he did not pull them down much, and certainly he would not avulse them. When circulation was unsatisfactory, it was generally because the stump was too long. When bursæ formed on the stump he advised leaving them alone; cutting a bursa out produced a scar, and that was liable to be rubbed into a sore. Faced with unsatisfactory arm stumps the surgeon should not indiscriminately remove all nerve bulbs, but only when a complaint of tenderness was made. Plexuses and nerve roots should not be interfered with. The upper limb was to some extent a sense organ; most of the pain felt in a stump was of central origin, the brain had little to do, and the importance of fitting an artificial limb early was that it gave the patient an objective. Experience at Roehampton was against disarticulation at the shoulder-joint for shivering arm stumps.

Mr. R. D. LANGDALE-KELHAM said it had been on the principle of trial and error that in this matter of limb-fitting after amputation definite facts were established. The civilian population was largely in the hands of the limb-makers, some of whom were good, others lacked anatomical knowledge. Many amputees were suffering unnecessary discomfort. The ideal above-knee stump for a prosthesis was one at the great trochanter, and for this type two forms of limb were available: (1) the American or central knee control; (2) that depending for its action on a special type of pelvic band and knee connexion. Under-support was better than over-support, for the patient was encouraged to develop his own powers. It was better as a rule to leave neuromata alone, but removal might enable a limb to be fitted. Sooner or later every stump over 12 inches in length would develop circulatory troubles, requiring eventually reamputation; he was not referring to disarticulation at the knee, but to the Stokes-Gritti operation. He had a strong dislike of the Syme amputation, though admittedly the Syme stump was a powerful one. Its average life, however, was no more than ten years. Callosities formed sooner or later in every Syme stump, and became very painful; sometimes they were actually in the scar. The ideal site for a below-knee amputation was 6 to 7 inches below the knee. The surgeon's responsibility did not cease when he had sent the patient, with or without a prescription, to the limb-maker; he should assure himself that the man had a limb which fitted his stump properly, and was one he could make use of. Moreover, the limb-maker required surgical advice and supervision. At Roehampton it had been found that the better the limb-maker the more did he welcome the surgeon's coöperation.

Captain A. R. MAXWELL said there were three factors to consider—the surgical, the technical or mechanical, and the psychological—and these could not be considered apart without harm to the patient. It was much simpler to provide an artificial limb for the lower extremity than for the upper, for the arm was a more complicated piece of mechanism with its requirements of flexion, extension, abduction, adduction, pronation, supination, and ability to grip. A stump might be surgically good but prosthetically bad; if prosthetically good it could not be surgically bad. The surgeon should plan his amputation to

accord with the prosthesis to be fitted, and give use and comfort. Some of the younger men studying for the Fellowship came to Roehampton to learn the use of appliances. There could be no standardisation in these matters; each patient presented his own peculiar problem for solution. In his own case the arm stump was less than 3 inches long, yet he could dig, plough, and use tools for wood and metal work. He emphasised the value of the will to succeed.

A demonstration was given of fitting artificial limbs.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

A MEETING of this Society was held at Sheffield on Feb. 28th, Dr. J. W. BURNS, the President, being in the chair, when a discussion took place on a paper read by Mr. W. W. KING (Sheffield), at the Manchester meeting on Jan. 24th, entitled

THROAT INFECTIONS AS AN ÆTIOLOGICAL FACTOR IN PUERPERAL SEPSIS.

Mr. King in this paper suggested that hæmolytic streptococci can be conveyed to the genital tract of a parturient woman by "spraying" from the throat of an attendant. In his view faulty antiseptic methods could not be the sole cause of puerperal sepsis because the rate had not fallen during the past 20 years in spite of the almost universal use of antiseptics, and because puerperal sepsis occurs in "born before arrival" cases, in hospitals in spite of every care, and in the private practice of even the most careful doctors and midwives. Hæmolytic streptococci, recognised as the chief cause of serious puerperal sepsis, were a frequent cause of diseases of the upper air passages, especially during the winter months, when the mortality from puerperal fever from all causes was highest.

The rate of admissions to the septic wards of the maternity hospital (the Jessop Hospital for Women), where Mr. King's investigations had been carried out, was constant more or less throughout the year, but hæmolytic streptococcal infections were more prevalent in the winter. Infection from the attendant's hand during this season was unlikely, since the organism was so easily killed by the simplest antiseptic methods. Moreover, of hæmolytic streptococcal infections in the cases under review the natural labours without interference had a higher percentage (46·5 per cent.) than either operative deliveries (34·6 per cent.) or abortions (5 per cent.). Mr. King gave reasons for doubting the possibility of prenatal infection of the vagina or of autogenous infection.

Kanter and Pilot had been the first to suggest in 1924 that puerperal infection could be "sprayed" from the throat of an attendant on to a woman in labour. Mr. King gave case records of 24 cases of puerperal sepsis from hæmolytic streptococci, of which all but three had spontaneous labours, in nearly all of which carriers were found among the contacts. One epidemic stopped when the use of masks was instituted. The conclusion reached by Mr. King was that the spread of hæmolytic streptococcal infection from the throats of "carriers" to parturient women is an important factor in the ætiology of puerperal fever which requires an extensive and coördinated investigation from every angle. On the assumption that this theory was correct he suggested as prophylactic measures: (1) the use of masks for all examinations which exposed the vulva of the patient, either during labour or for post-partum nursing; (2) a pregnant woman who had been in contact with anyone suffering from a sore-throat should have her throat and vagina examined for hæmolytic streptococci; (3) nurses with even slightly sore-throats should be excluded from maternity wards; (4) patients with sore-throats should be isolated; (5) at the first onset of pyrexia a vaginal or cervical swab should be examined for hæmolytic streptococci, not only in order to treat the patient but also to give early warning of the possible presence of a "carrier." Local authorities should seek out "carriers" in connexion with every case of puerperal fever.

Desirability of Wearing Efficient Masks.

The PRESIDENT described two small epidemics which had occurred in a well-equipped hospital of 15 beds; in the first outbreak two, and in the second three nurses had the hæmolytic streptococci in their throats. He had not endeavoured to trace evidence of close association between the carriers and the cases which developed pyrexia, but had no doubt in his own mind that the infection took place during the early days of the puerperium in both epidemics, rather than during the actual labour. This was to some extent supported by the fact that since gloves and masks had been adopted in the wards no similar cases had occurred. Mr. King had focused attention on the hæmolytic variety of streptococci, but the President thought that the non-hæmolytic type which were present in the throats of several nurses in both the epidemics noted by him were also capable of producing a virulent infection in the puerperal woman. They had to guard their patients against all organisms which might be present in the throats of any of the attendants. The whole question of lying-in ward technique required reorganisation and readjustment. At present very stringent rules were made for the labour ward, caps, masks, gowns, &c., were insisted upon, yet within 12 hours of the baby being born the mother had her vulval toilet carried out by a junior nurse who wore neither a mask nor gloves. He asked Mr. King whether the masks usually worn at operations were a sufficient protection to the patient, and whether he had any experience of treatment by streptococcal antitoxin.

Prof. W. BLAIR BELL (Liverpool) agreed that streptococcal infection was often conveyed to patients from sore-throats. Preparturitional vaginal infections by streptococci were not autogenous, but resulted from the introduction of organisms from without. He had called attention to the danger of late coitus in this respect at the Obstetrical Congress in 1925. The acidity of the amniotic fluid (pH about 5·5) made it a valuable antiseptic douche from above. The increased dangers of operations after the escape of the fluid might be explained in this way. Infection might be carried into lying-in wards by visitors. If it was impossible to exclude them, their numbers should be strictly limited. Infection might be carried from one patient to another by bed-pans.

Prof. MILES H. PHILLIPS (Sheffield) was convinced that sprayed streptococci were a very real source of infection of women in labour or recently delivered, and welcomed Mr. King's paper. Dame Janet Campbell had given details of several small epidemics associated with nose and throat carriers of the hæmolytic streptococcus. He referred to experience gained in general and especially abdominal surgery, which had led the great majority of surgeons to insist on the use of a face mask, and gave examples from his own practice of the desirability of using efficient masks. Those made of a single thickness of butter muslin had been shown by bacteriological tests to be quite ineffective. A mask of four thicknesses of surgical gauze (each of which was itself four-fold) was probably effective. Thirty per cent. of the fatal cases recorded at the Congress on puerperal sepsis in London in 1925 occurred after a normal labour, and in 65 of the 256 cases investigated by Dame Janet Campbell in 1921–25 it was said that no internal examination had been made.

The Need for Further Controls.

Mr. LEITH MURRAY (Liverpool) considered that further control experiments were necessary before fully accepting the "droplet infection" theory as conclusive. He did not think that the wearing of masks would lead to any reduction in the incidence of sepsis, and went on to relate briefly two cases of puerperal morbidity which had occurred in a hospital.

The first of the series was subsequently proved to be a case of scarlet fever. Of the 15 attendants in this hospital, six had positive swabs from the throat of hæmolytic streptococcus, and in his opinion this incidence was the result rather than the cause of the morbidity in the scarlatinal case.

Prof. J. S. C. DOUGLAS (Sheffield) pointed out that the difficulty of identifying strains of streptococci should not be allowed to hamper the search for carriers of the organism responsible for puerperal infection. The fact that a certain proportion of pregnant women harboured hæmolytic streptococci in the vagina or cervix without developing trouble, rendered the effect of the introduction of hæmolytic strains by carriers the more noteworthy. Mr. King's thesis, though not proven, afforded such strong evidence that it was worthy of serious attention and would form an important basis for the further attack on the problem of puerperal infection.

Mr. W. GOUGH (Leeds) thought that all throats contained streptococci and that another factor besides this must be looked for.

Mr. A. GOUGH (Leeds) said that the reason why the morbidity-rate had not fallen was possibly due to a greater proportion of primigravidæ than in the earlier returns of the Registrar-General.

Some Criticisms.

Mr. J. ERIC STACEY (Sheffield) whilst considering that every possible channel by which infection could enter ought to be closed, and advocating the use of masks, said he was not convinced that this mode of entry was the main route by which the organisms were introduced. Mr. King claimed only that spraying from the throat was one method by which the infecting organisms could obtain entry; all would accept this, but it should not be allowed to cloud other issues, for example, why in certain cases puerperal sepsis should develop and in others fail to appear. The number of women subjected to the spraying from the throat of an attendant who developed no sepsis was vastly greater than that of those who did, and yet the organisms had an equal chance of introduction. He agreed with Mr. Murray that further controls were necessary. It seemed unlikely that "throat spraying" could occur except from persons actually delivering the patient or the nurse doing the subsequent vulval swabbing. Epidemics of hæmolytic streptococcus infection occurred in gynæcological cases from time to time where all wore masks in the theatre, and where the infection occurred only in a small proportion of patients. A large number of cases arose in which hæmolytic streptococci are not the causal organism, and a few in which the throat could not be the source of infection—e.g., *Bacillus aerogenes capsulatus*. He had recently investigated for another purpose a series of 152 cases of "failed forceps." Twelve of these cases died from puerperal sepsis, but the hæmolytic streptococcus had been isolated from only three of them. In three cases gas-forming organisms were found and in the remaining six non-hæmolytic streptococci. Trauma, associated with an exogenous source of infection, such as fæcal infection, was a factor which must not be lost sight of.

Prof. A. M. CONNELL (Sheffield) thought the individual herself must have hæmolytic streptococcus in her throat if throat infection was to be accepted as the causal factor.

Dr. J. A. STIRLING (M.O.H., Chesterfield), while expressing alarm at the thought that this method of infection might be so prevalent, considered the isolation of contacts in hospital almost impossible. He thought coöperation was necessary between family doctor, hospital, and public authorities.

Reply.

Mr. KING said that he had been careful to state that he did not exclude other sources of infection. It was premature to attempt to grade the importance of his theory in the causation of puerperal fever. He was satisfied that he had produced sufficient evidence to satisfy reasonable people that this avenue of infection must be closed. It did not seem much to ask that obstetricians should adopt the same care for their maternity cases as they did for their gynæcological operations. In regard to controls, Mr. King suggested that the best test of the value of the theory would be the results obtained by the use of masks during the next five years, especially in maternity hospitals. He was confident that if the scheme was conscientiously carried out, puerperal fever in "booked" cases in maternity hospitals would be as rare as suppuration in laparotomy wounds. In anticipation of the objection that a large proportion of the population had hæmolytic streptococci in their throats during the winter months, Dr. Kirk, at his request, had examined swabs from the throats of 50 out-patients taken at random during the month of February, and only one was found to be a carrier. These results confirmed those given in his paper. As Prof. Douglas had said, final proof of the identity of the streptococci in the carrier and victim could only be obtained when accurate classification of hæmolytic streptococci was possible. Almost any organism could be carried to the patient in this way, including anaerobic organisms, which are well known to be occasional inhabitants of the throat. Mr. King found it easier to believe that *B. aerogenes capsulatus* could get into the vagina from the throat of an attendant than that it should get in on the doctor's hands or instruments. In regard to "autogenous" infection, he accepted Prof. Blair Bell's definition. There was surprisingly little positive evidence in favour of preparturitional infection as a cause of puerperal fever. In the scarlet fever case quoted by Mr. Leith Murray the patient might have been the victim of the attendant carriers. The relatively small number of cases of puerperal infection had been put forward as an objection to the droplet theory. The same objection was made to the contagion theory of Semmelweis. No more was known to-day than was known a century ago as to why only a few of those subjected to infection develop the disease. Infection from the rectum was improbable, since it so rarely followed gynæcological operations. He thought that masks made of four layers of butter muslin were probably satisfactory if not worn for more than two or three hours. He agreed that it was not always possible to exclude known carriers from the wards, and if so, reliance had to be placed upon masks. Great watchfulness was necessary to see that the masks were always worn for vaginal examinations and during the administration of enemata as well as for delivery and the subsequent nursing.

DONATIONS AND BEQUESTS.—Mr. George Harding, of 164, Great Russell-street, London, left estate of the value of £18,015. He left the property in trust for his wife and his daughters during their lives, with remainder to the survivor for life, and on the death of the survivor as to one-fourth to Cheyne Hospital for Children, one-fourth to the Hospital for Sick Children, Great Ormond-street, one-half to Charing Cross Hospital, St. Thomas's Hospital, Middlesex Hospital, St. George's Hospital, Westminster Hospital, and the Royal Ear Hospital.—Mr. William Brown, of Invercloy, Ayr, and West Nile-street, Glasgow, East India merchant, left, among other bequests, £1000 each to the Ayr County Hospital and the Royal Hospital for Sick Children, Glasgow; £500 each to the Glasgow Royal Infirmary, the Glasgow Western Infirmary, and the Glasgow Royal Cancer Hospital.—Mr. Thomas Hammett, of Chorlton-cum-Hardy, Manchester, who left £15,891, after a few bequests gave the residue of the property to the Royal Infirmary, Manchester; the Eye Hospital, Manchester; St. Mary's Hospital for Women, Manchester; Ancoats Hospital, Manchester; the Children's Hospital, Pendlebury, Manchester; Henshaw's Institute for the Blind, Manchester; and the Boys' and Girls' Refuge, Belmont, Manchester.—Mr. Frederick George Nutting, of Sutherland and London, among other bequests, left £1000 each to the Liverpool Royal Infirmary and St. Dunstan's Hospital for Blinded Sailors and Soldiers.—Mr. James John Blundell, of London, left £5000 to the Freemasons Hospital and Nursing Home; £1000 each to the London Hospital, the Middlesex Hospital, University College Hospital, the Royal Free Hospital, the Royal Northern Hospital, the Brompton Hospital for Consumption and Diseases of the Chest, King Edward's Hospital Fund for London, Dr. Barnardo's Homes, and the National Institute for the Blind, besides other legacies.

Reviews and Notices of Books.

PSYCHOLOGY.

The Process of Human Behaviour. By MANDEL SHERMAN, M.D., Ph.D.; and IRENE CASE SHERMAN, Ph.D. London: Williams and Norgate. 1930. Pp. 227. 12*s.* 6*d.*

THIS volume is frankly experimental and behaviouristic. That is to say, its exposition is based upon the thesis that human behaviour is exclusively the product of neural reaction to environment. The authors give a general account of nervous mechanisms, starting from the irritability of organisms to the structure and function of the human brain. They then describe in the manner of J. B. Watson the first human responses and also give their careful observations on the emotions of newly born infants. They conclude that there is a more or less quantitative relationship between stimulus and response. As can be well understood the thesis leaves little or no room for mind, and the whole study of personality and of social behaviour is based without relent upon the structure and function of the reflex arc and of the glands which govern emotivity. On this level of discussion the book is a good exposition of human behaviour, but for those who feel that the subtler reactions of man need something more than neural mechanisms for their explanation the thesis of the authors will not appear quite so satisfactory.

Psychology's Defence of the Faith. By DAVID YELLOWLEES, M.D., Ch.B. London: Student Christian Movement Press. 1930. Pp. 190. 5*s.*

THIS volume consists of series of lectures given before the Student Christian Movement, 1929; they have otherwise undergone little modification. The author, while being himself a practitioner of psychopathology, is also a man deeply imbued with religious feeling and faith. He has felt the need for bringing religion before the tribunal of psychology and psychology before the throne of religion. He has attempted to show that while psychology throws a profound light upon the religious life, it cannot do anything to alter the fundamental truths of religion or to diminish the glory of religious personages who have inspired mankind throughout the ages. He is deeply impressed with the views of Freud, but in so far as this pioneer is a Determinist, he feels himself more akin to Jung, whose philosophy allows for that human freedom which the religious life needs. The book is unfortunately marred by a certain colloquialism in expression which may have been necessary in speaking to students, but which rings unpleasantly in the ear when read in a serious volume.

"*Just Normal Children.*" By FLORENCE MATEER, Ph.D., Director of the Merryheart Schools, Columbia, Ohio. London: D. Appleton and Co. 1929. Pp. 294. $2·50.

THE author has laid out her book on a plan which has brought out the extraordinary human side of this problem—the difficult child. She has described in a straightforward narrative way the lives of little children, their behaviour, their health, and their intelligence, stating how each was affected by some particular maladjustment, physical, psychological, or both. She tells how the subject of each disorder was studied empirically over a period of time, and how each disorder was corrected. The chapter ends with a series of questions arising out of the case, each question being answered with the wisdom derived from knowledge, common sense, and sympathy. The whole field of child guidance is explored, and the author has tried hard to make her observations and treatment clear to the non-technical reader. She does, however, give such ready answers to the questions which she herself has set that the book may give a false impression to the reader as to the ease with which a maladjusted child is brought back to normality. The book may not satisfy all readers, but the value of the questions which are liberally sown throughout the book and of the case-histories is beyond dispute.

MANUAL OF PHYSICS.

Third edition. By J. A. CROWTHER, Sc.D., F.Inst.P. London: Humphrey Milford, Oxford University Press. 1930. Pp. 562. 14*s.*

As some seven or eight impressions of this manual have appeared its value cannot be called in question. The standard of the book is that of the numerous examinations which are coördinated by the Board of Education under the title School Certificate Examinations, including the revised Senior Local Examinations. The object has been to bring the principles of physics clearly before students, as the author's experience has shown him that a certain assimilation of facts is often not combined with a corresponding general appreciation of the subjects under study. The space devoted to mechanics remains, as in the original issue of the book, predominant, and all who have had any personal knowledge of the difficulties of students will agree that a full explanation of the properties of matter makes all instruction along further and more special lines much easier. The additions to the latest issue of the book will be found mainly in this section and under the heading of electricity.

IMMUNITY AND INFECTIOUS DISEASES.

By A. BESREDKA, Professor at the Pasteur Institute, Paris. Authorised translation by HERBERT CHILD, M.R.C.S., L.S.A., late Hon. Surgeon, French Red Cross; Capt. R.A.M.C. (T.Y.). London: Baillière, Tindall and Cox. 1930. Pp. vi.+320. 18*s.*

THIS is a series of 15 essays upon different aspects of immunity which Prof. Besredka has especially investigated during the past 30 years. They include a number of subjects, such as the bactericidal power of leucocytes, the bacterial hæmolysins, the problem of the unity or diversity of the streptococci, &c.; but except for the first few chapters the general theme running through the book is the problem of the active immunisation of the individual, with especial reference to local immunity and local tissue vaccination. Briefly, the views of the author, which are now well known, consist in a disbelief in the importance of humoral antibodies, either as factors in or indices of the immune state, and a belief in the supreme importance of especially sensitive tissues, which by local treatment may be rendered immune, and thereby convey a general immunity. On the whole these essays are unconvincing. Many of them are only of historical interest, and it is difficult to know why they should be published to-day. We cannot believe that the distinguished author still holds that "the streptococcus met with in scarlet fever is not the specific agent—that to-day appears beyond a doubt." In many other respects the book is unsatisfactory. The reader who expects to find a reasoned, documented, and scientific exposition of Besredka's views will be grievously disappointed, and will gain the impression that the basis of his recent work is unsound and uncritical. Hardly any notice is taken of experiments or findings which are opposed to the author's views; practically everything quoted goes to substantiate them. The work of the translator does not add to the attractions of the book. His method of approach is so literal that French constructions appear on almost every page. Whilst a translator is bound to render faithfully the sense and meaning of the original, he is not debarred from the idioms of the language he is employing.

"The bodies of the bacilli emulsified in the physiological salt solution are placed in a cylindrical test glass, containing non-heated anti-plague serum, very agglutinant." . . . . . "It was Theobald Smith who had this idea. In preparing

it he did not suspect, at the outset, that he was doing anything but realising a true sensitised vaccine."

These examples will illustrate the use of inappropriate English words which occurs on almost every page. Moreover, although "diastase" is loosely used in France for the whole body of ferments and enzymes, it is incorrect to translate the word literally when speaking of a hæmolysin. Another word which also has a much more narrow meaning in English than in French is "virus," and yet we find it employed as synonymous with bacteria. On page 202 we find the expression "the stock or auto-vaccine."

The past work of the author has given him a deserved reputation in all countries, and many laboratory and clinical workers are anxious to evaluate his new and interesting theories. It is therefore unfortunate that this book will not give much help to those who are prepared to consider new ideas without bias.

ANIMISM, MAGIC AND THE DIVINE KING.

By GÉZA RÒHEIM, Ph.D. London: Kegan Paul, Trench, Trübner, and Co., Ltd. 1930. Pp. 390. 21*s*.

THIS is an addition to the now extensive literature of anthropology. The subject is dealt with under such general sections as animism and the psychology of magic, the medicine-man and the art of healing, the divinity of the king as successor to the medicine-man, and the sacrifice of the king as scapegoat for the sins of the people. The collection of native legions which the author has got together is remarkable alike for the width of its references and the repulsiveness of the episodes and examples set down. The section entitled the medicine-man relies for its facts largely upon the recorded habits of primeval races, but it is difficult to see how far these notes on savage life and scenes, even when recorded with some intention of consecutiveness, will be of any value to modern medicine. Serious psychological study, which is now so definitely associated with the study of medicine, is not likely to be advanced by any teaching conveyed by the book, although the habits and customs set down confirm much common knowledge as to the development of civilisation. The design has been to apply the modern principles of psycho-analytical research to explain the workings of the primitive mind.

ELECTROCARDIOGRAPHY.

Principles and Practice of Electrocardiography. By CARL J. WIGGERS, M.D., Professor of Physiology, Western Reserve University, Cleveland. London: Henry Kimpton. 1929. Pp. 226. 30*s*. 6*d*.

THE advent of electrocardiography as a method of examination, the value of which has now received general recognition, sufficiently accounts for the large number of text-books devoted to the subject. A few of these are highly technical. The vast majority, however, are written for the practitioner. Indeed, as Prof. Wiggers expresses it in his preface, they are often content merely to give "arbitrary rules for turning knobs and closing switches . . . . . with empirical directions for interpreting the records obtained." It is refreshing to find a book in which the author has struck out on a new line. As a physiologist with a leaning towards the physical side, Prof. Wiggers is able to speak with authority on the instrumental aspect of the subject. His book is primarily intended to give the medical practitioner a fuller understanding of the physical principles involved. The first hundred pages are devoted to general principles, and a full description is given of the various types of galvanometers in general use. It is perhaps unfortunate that the writer contents himself with describing these various instruments, and does not express any opinion on their relative merits and defects, but nevertheless this section gives all the information which a cardiologist is likely to require on the technical side. The remainder of the book is devoted to a systematic consideration of normal and abnormal records. Typical examples are given of the various abnormal types of electrocardiogram commonly met with in practice; the analysis of the records is explained, the physiological and clinical significance of the disorders is discussed, and treatment is considered.

This book, written by a physiologist for clinicians, could with advantage have been published as two separate volumes. The presentation of the physical aspect is admirable, and without being too technical gives a very complete account of the subject. It will appeal essentially to the cardiologist who is interested in the scientific side of his work. The clinical section, however, is rather too elementary for him. It would serve well as an introduction to electrocardiography for the general physician or for the physiologist who is less familiar with clinical problems. The illustrations are excellent, and the general get-up of the book leaves nothing to be desired.

JOURNALS.

BRITISH JOURNAL OF CHILDREN'S DISEASES. Vol. XXVII. January–March, 1930.—Dr. Fergus R. Ferguson and Dr. Macdonald Critchley contribute a Clinical Study of Congenital Neurosyphilis, Part II., in which they record their observations on 36 cases, eight of which were congenital tabes, 12 congenital tabo-paresis, and 15 congenital general paralysis of the insane, while one was not classified. The clinical aspects of the cases are described and compared with some of the other cases collected from the literature. A useful bibliography is appended.—Dr. C. Worster-Drought and Dr. T. R. Hill report a case of Arrest of Physical Development (with Respiratory Dysrhythmia) following Epidemic Encephalitis in a boy aged 14, in whom the symptoms dated from an attack of epidemic encephalitis four years before. They suggest that the condition is due to the hypothalamic centres being involved to a much greater degree than occurs in post-encephalitic obesity and in the dyspituitary syndromes approximating to the Fröhlich type which occasionally follow epidemic encephalitis.—In a paper on the Treatment of Spastic Paralysis in Children, Dr. J. G. Johnstone, medical superintendent of the Heatherwood Orthopædic Hospital at Ascot, maintains that much can be done by operation to alleviate spastic paralysis in a very large percentage of cases. He regards Stoffel's selective motor nerve resection as the method of choice in all cases, as it yields the best results, is always easy of application, and requires less prolonged after-care.—Dr. Jean Smith describes An Unusual Cardiac Malformation: Cor Triloculare Biventriculare with Mirror Picture Dextrocardia. The patient was a male infant, aged 36 hours, admitted to hospital with marked cyanosis and considerable respiratory distress. The apex-beat was in the fifth right intercostal space. No thrill was felt and no murmur was heard. Death took place 16 hours after admission and the condition described in the title was found at autopsy.—Dr. Hilda N. Stoessiger records a case of Recovery from Pneumococcal Meningitis with a review of the few other cases reported in the literature. The patient was a girl, aged 5 years, in whom the meningitis was secondary to otitis media. Organisms resembling degenerate pneumococci were seen in films of the turbid cerebro-spinal fluid, but no cultures of the organism were obtained. Recovery followed subcutaneous and intrathecal injection of 0·5 per cent. mercurochrome solution.—In a paper entitled Some Pædiatric Eponyms II. Parrot's Nodes, Dr. Walter R. Bett gives a translation of Parrot's original description of the nodes in his Maladies des Enfants (Paris, 1886), followed by an account of his life and his other contributions to medicine, and illustrated by a fine portrait and a plate of a natiform skull.—The abstracts from current literature are devoted to dermatology and syphilis.

THE LANCET.

LONDON: SATURDAY, APRIL 12, 1930.

LOCAL GOVERNMENT AND HOSPITAL ACCOMMODATION.

THE Committee of King Edward's Hospital Fund for London has prepared a useful memorandum on the powers and duties of local authorities in the matter of hospital accommodation under the Local Government Act of 1929. Its form—almost a "counsel's opinion," drawn up by Mr. A. M. TRUSTRAM EVE—is significant of the complexity of the legal position. Indeed a further minor modification has already occurred since the memorandum was framed, as references to the Poor Law Act of 1930 (which received the Royal Assent on March 20th) must now be substituted for the corresponding references in the memorandum to the Poor Law Act of 1927. The chief changes which last year's Local Government Act brought about were structurally changes in the poor-law. Part I. of the 1929 Act was headed "Poor Law," and, as is now well known, the first step taken by the Act was to abolish the boards of guardians and to transfer the functions of all former poor-law authorities to the councils of counties and county boroughs. When, therefore, any attempt is made to explore the present powers and duties of local authorities for the provision of accommodation for the sick, there are three questions to be answered. What were the powers and duties of the former poor-law authorities which the Act has transferred? What were the powers and duties which the county and county borough councils already possessed in this matter? And what fresh powers and duties does the Act create? The answer to the first question is that boards of guardians had a general duty towards the sick, expressed in Section 34 of the Poor Law Act of 1927 (now Section 15 of the 1930 Act), "to provide such relief as may be necessary for the lame, impotent, old, blind and such other persons as are poor and not able to work." The guardians could pay for medical or other assistance required by such persons as the result of accident or sudden illness, they could subscribe to hospitals, infirmaries, or other approved institutions receiving such persons; they could deal with maternity cases under their general powers of poor relief, and provision for infectious diseases (with which we are not at present dealing) could be similarly made under those general powers. Guardians, of course, provided workhouses; they could, if necessary, be ordered by the Central Department to provide "workhouse accommodation"—an expression which included hospital or infirmary accommodation. They have in point of fact established a system of sick infirmaries and sick wards in workhouses apart from their normal workhouse accommodation. Thus it comes about that the county and county borough councils take over a nucleus of separate infirmaries (virtually State hospitals), fulfilling a purpose far wider than their original narrow function as workhouses in the Elizabethan sense. These infirmaries not only supplemented the voluntary hospitals, they have also filled the gap where no voluntary hospital existed. The future working of the voluntary hospitals alongside these rate-aided institutions and the avoidance of wasteful competition or overlapping are objects which the Special Committee of the King's Fund is particularly concerned to promote.

The second and third questions may be answered together. Outside London, as Mr. TRUSTRAM EVE observes, county borough councils, borough councils, and urban and rural district councils have the power (but not the duty) to provide for the use of the inhabitants of their districts "hospitals or temporary places for the reception of the sick." They could build hospitals themselves in their own or in other authorities' districts; they could contract for hospital accommodation or combine with other councils for a common hospital; and they could make reasonable subscriptions, not exceeding a penny rate, to voluntary hospitals by virtue of Section 64 of the Public Health Act of 1925. County councils (including the L.C.C.) had no power to provide hospital accommodation for ordinary illness or to subscribe to voluntary hospitals until Section 14 of the 1929 Act made this possible. The county council is now brought into line with the other local authorities already mentioned; the limit of a penny rate is increased by 33⅓ per cent. under Section 75 of the 1929 Act. Meanwhile the county borough, borough and district councils continue to exercise their functions in this matter as before; they continue also to exercise (with departmental sanction) the power to provide a temporary supply of medicine and assistance to poorer inhabitants under Section 133 of the Public Health Act of 1875—a power still denied to county councils. In London the metropolitan borough councils similarly continue to use their powers under Sections 75 and 77 of the Public Health (London) Act of 1891, unaffected by the 1929 Act, or by the fact that the 1929 Act gives similar powers now to the London County Council. The result of the transfer of poor-law functions is that county and county borough councils now possess alternative powers—powers which can be exercised as poor-law functions or as public health functions. The administrative schemes under the 1929 Act, according to Section 5 thereof, are expected to declare that various statutory forms of public assistance shall be made available exclusively under the statutes concerned rather than by way of poor relief. As Mr. TRUSTRAM EVE says, without a study of the administrative scheme it is impossible to appreciate the methods to be adopted byt he local authority in providing hospital accommodation.

One might add that the medical profession will also be considerably affected by the administrative arrangements whereby the local authority may delegate specific functions to committees and subcommittees. The thrusting of immense tasks of local government and public health over wide areas upon county and county borough councils will strain the machinery unless the main bodies are relieved by committees of much of their work. Committees and subcommittees will presumably have to deal with such matters as the general provision and management of hospitals and local medical services, the staffing and residential arrangements of hospitals, discipline and patients' complaints, medical education and training, and facilities for research. Much will turn upon the experience and outlook of the committeemen to whom these matters are entrusted. There remains another vital task of negotiation. Under Section 13 of the Local Government Act of 1929 (now replaced by Section 8 of the Poor Law Act of 1930), before the local authorities make their final arrangements they must consult "with such committee or other body as they consider to represent both the governing bodies and the medical and surgical staffs of the voluntary hospitals providing

services in or for the benefit of the county or county borough as to the accommodation to be provided, and as to the purpose for which it is to be used." The intention of Parliament is clear enough, but the fulfilment will be far from simple.

AMPUTATIONS AND ARTIFICIAL LIMBS.

A VALUABLE feature of the discussion on amputations and their relation to the artificial limb reported on p. 807 was the opportunity given to surgeons and limb-makers to exchange views upon their common task. Patients were also present, chosen to illustrate how by combined efforts a limbless man could be made comfortable in his appliance while regaining much of his former mobility and force. It was stated that in this country 50,000 people had limbs amputated as the result of the war, and the knowledge gained by surgeon and limb-maker in the handling of this crippled and maimed population has resulted in a revision of values. In the early days of the war most of the well-known classical amputations were accepted as standard operations, and none seemed more secure of its place than Syme's amputation. But now that more than ten years have elapsed since the conclusion of hostilities, the time is ripe for an assessment of end-results.

One outcome of the experience which has been gained is that an end-bearing stump in the lower limb is regarded unfavourably. Mr. MAX PAGE, who introduced the discussion, said that those who had seen numbers of cases would agree in condemning Syme's amputation, since a large proportion of these stumps did not bear the test of time, and in any case could only be fitted with a clumsy prosthesis. He had seen many Syme's amputations which had given good service, but had been obliged to reamputate others which were painful and had no functional value. Mr. JENNER VERRALL, from his experience at Roehampton, also condemned the Syme's amputation, as did Mr. LANGDALE-KELHAM. The end-bearing thigh stump, such as the Stokes-Gritti, was also deemed undesirable, but was said to be still popular in America, Canada, and Germany. In below-knee amputations, the most satisfactory stump was agreed to be one preserving 6 or 7 inches of the tibia, although even with 4 inches control of the knee could be obtained. For above-knee amputations, section of the femur about 4 or 6 inches above the level of the knee-joint seemed to give the best functional results when an ischial-bearing prosthesis was fitted. Mr. MAX PAGE deprecated the custom of pulling on the nerves at operation and cutting them high up because of the danger of post-operative pain. It was best to crush and cut them about an inch above the level of bone section and inject absolute alcohol into the nerve-ending. Some surgeons, when amputating through the thigh, inject absolute alcohol into the sciatic nerve at an early stage, thereby producing a nerve block which diminishes the operative shock as well as lessening the prospect of post-operative pain. Emphasis was laid on the necessity of maintaining good tone in the muscles of the stump during the convalescent period and of avoiding joint contracture. It is obviously easier to fit a purposeful artificial limb to a stump with well-functioning muscles than to one with poor muscular control. During the war period considerable attention was paid to the cinematic amputations of Vanghetti, where muscles and tendons were more directly employed in the manipulation of appliances, but apparently this type of operation is now seldom performed, either because the results are uncertain or because of improvements in the artificial limb. There can be no doubt that for the successful reconditioning of a man with an amputated limb there must be complete coöperation between patient, surgeon, and limb-maker. Captain A. R. MAXWELL, who took part in the discussion, stressed this team spirit and added that "A stump might be surgically good but prosthetically bad; but if it was prosthetically good it could not be surgically bad." Each patient presents a peculiar problem; if the surgeon plans the amputation to accord with the prosthesis to be fitted, and the patient coöperates with goodwill, success should be assured. Captain MAXWELL in his own person provides an example of successful team-work; he has an artificial left arm, and although the stump is less than 3 inches long yet he can dig, plough, and use tools for wood and metal work.

The discussion has served a useful purpose in placing before the profession authoritative views upon amputations and their relation to the artificial limb founded on prolonged experience. If regret is felt that certain time-honoured amputations have failed to maintain their traditional place in surgery, it must be remembered that this failure is only in response to technical requirements far more exacting than those formerly made. The artificial limb has been improved out of all recognition in mechanical detail and in convenience. Only those who have to wear an artificial limb know the great comfort of a light appliance, and the light metals have provided the makers with material for a strong limb of little weight. Until the war the question of amputations was largely academic; surgeon and limb-maker worked in isolation, and little progress resulted. Indeed on the continent a type of artificial limb frequently fitted was of the same pattern as that originally designed by AMBROISE PARÉ in the sixteenth century. The advance made during the last dozen years or so in treating the limbless and providing for their comfort and usefulness is man fest

CONTROL OF MEASLES.

MEASLES, whooping-cough, and diphtheria head the list of lethal acute specific infections of young children. Diphtheria ranks third and may, if the community so desires, virtually cease to rank at all; an efficient method of prevention is available for the asking. Of measles it might almost be said that it is one disease for the rich and another for the poor. Measles in the nursery entails as a rule a few days of discomfort and confinement, made up for by a subsequent enlargement of liberty at the seaside. Measles in the tenement house or slum dwelling is very different. The biennial epidemics in the great industrial centres result in the loss of many lives of young children (witness the Registrar-General's weekly return just now) and in permanent damage to an unknown but certainly very great number more. In a recent study reported to the Medical Research Council (Special Report No. 120) J. L. HALLIDAY established some important facts in the epidemiology of measles. He found quite definitely that in the tenements selected (in Glasgow) children were exposed to measles at the earlier ages of life, the period when the case fatality is highest. Although throughout Great Britain measles is essentially a disease of childhood, the period of child life in which an attack takes place varies. Among crowded tenement quarters the disease mainly attacks children under school age; in working- and middle-class families, who live in houses of the single-entry type, the disease is predominantly one of scholars from the age of

5 to 10 years. Among the public school class the age of incidence seems to be postponed to a still later period of school life. A. I. SIMEY [1] regards it as an unfortunate result of the present precautions taken to prevent the introduction of infectious disease into boarding schools that a great number of boys pass through private schools without having contracted measles. Similar precautions in the public schools lead at length to a really great and serious epidemic involving overcrowding of the school sanatoriums; as a result of which complications arise which, in his experience at Rugby, turned an epidemic into a nightmare. G. E. FRIEND, from his experience at Christ's Hospital, finds that the isolation of infectious diseases combined with the exclusion from school of known contacts had the result of reducing the number of epidemics, but of increasing the number of boys infected when the epidemic did occur. SIMEY and FRIEND would thus prefer measles to break out in their semi-isolated communities on a smaller scale at more frequent intervals, and having regard to the age-groups and stamina of the boys under their care no doubt they are right. For the public school probably the best thing is to let measles take its course, little and often. Not so, however, in the tenement, where younger children are concerned. HALLIDAY estimates the case-mortality for ages from 0–2 years as 10 to 20 times greater than for ages from 5–10, and so on in decreasing (but still excessive) ratio for ages up to 5. The reason of course is the greater incidence and fatality of broncho-pneumonia amongst the youngest age-group. What is the nature of this complication we do not know. According to DEBRÉ and JOANNON the virus of measles lowers the threshold for other infections; they regard the broncho-pneumonia of measles as a super-added specific infection. Broncho-pneumonia itself, a disease of the very young under-nourished child living in a crowded sunless environment, is sufficiently bad; as a concomitant of measles it is too often overwhelming.

A measles epidemic arises and attains its maximum incidence with great rapidity. Sir JOHN ROBERTSON, discussing a measles epidemic in Birmingham in 1908–09, showed that before the epidemic there occurred 31 deaths from measles in 20 weeks, during the epidemic period (January–May) 476 deaths in 20 weeks, and in the subsequent 20 weeks, the period of decline of the epidemic, 67 deaths. During an epidemic a large proportion of exposed susceptible children suffer an attack of frank clinical measles. The survivors attain solid active immunity as the result of the clinical attack. But HALLIDAY, from observations in the field, and P. STOCKS and M. N. KARN, as the result of the statistical analysis of the St. Pancras material independently deduced the development by some children during an epidemic of "a partial and probably temporary immunity" (Halliday) or "latent immunisation" (Stocks). Dr. STOCKS has further developed his views of the mechanism of an epidemic in our columns this week, and we commend this paper to careful study. Clearly there occurs during a measles epidemic what S. F. DUDLEY has shown to be the case for diphtheria, an epidemic of immunisation. Whether a child becomes solidly immune as the result of a clinical attack, or partially and temporarily immune, depends upon what DUDLEY calls the velocity of infection. The practical result would appear to be that some exposed children escape clinical attack in the first epidemic. When the next epidemic phase occurs they are in better case to withstand a clinical attack, not only because they are somewhat older, but also because they possess some degree of basal immunity. Unfortunately, it is impossible to control this epidemic of immunisation; in everyday life there is no means of regulating the velocity of infection. Owing to the characteristics of measles in the individual and in the community, notification as a means of control has been found to be of little value. Even if the requisite number of beds were available, and the public could be induced to regard measles sufficiently seriously to make full use of them, it is useless from the point of view of prevention to isolate a case which is only notified when the rash has appeared. At this stage, the maximum phase of infectivity—the catarrhal pre-exanthem or Koplik spots stage—has passed and the damage to the contacts by droplet infection has been done. Much useful curative work can be and is being accomplished in London and several provincial cities by hospital treatment of the severe cases or of those taken from the worst environment. Manchester provides for the notification by the practitioner of the first case occurring in a household; other cities have a system of partial notification through schools. The cases so notified are followed up by health visitors who offer general advice as to precautions to be taken, and sometimes by providing the services of a district nurse and essential nourishment. All such measures, useful as they undoubtedly are, only touch the fringe of the measles problem in industrial areas.

From the laboratory standpoint the position remains much as it was set out in J. E. MCCARTNEY'S review [2] three years ago. But while experimental research languishes, the clinical results of employing adult convalescent serum or whole blood for the attenuation of the disease in exposed susceptible children are being increasingly established on the Continent and in the United States of America. We have recently[3] endorsed the procedure of injecting parental whole blood as one available for the family doctor. In their admirable monograph, from which we have already quoted, DEBRÉ and JOANNON tell us that the serum of adults who have had measles in childhood contains immune bodies not only against measles but against several other infections. DEGKWITZ, in 1920, employed whole blood in 1000 cases. W. H. PARK, of New York, after a rigorous trial lasting 10 years, now advocates[4] the use of parental whole blood. Dr. STOCKS, from a profound knowledge of epidemic measles in a London borough, believes that even without isolating the virus we ought to be able to devise some simple method of partial and temporary protection which would prevent the distressing features of the biennial epidemic. It is clear that except under special circumstances, where even a modified attack of the disease is contra-indicated, sero-attenuation—which results in a lasting active immunity—is preferable to sero-prevention, which confers passive immunity valid for a month at most. The basic causes of the high mortality of young children from measles are doubtless to be sought in poverty, in an improper dietary deficient in vitamins, and in overcrowded sunless dwellings. These conditions must be ameliorated. But that will take time and meanwhile it is certain that sero-attenuation amongst susceptible contacts will save many lives. The children in the family most likely to

[1] THE LANCET, 1926, ii., 1057.

[2] THE LANCET, 1927, i., 92. [3] Ibid., March 8th, p. 519.
[4] Med. Officer, March 1st, 1930.

be attacked first are those of school age. Notification of the occurrence of measles amongst these might with advantage be followed by the prompt injection of those members of the family below school age, the aim being not prevention but attenuation.

Annotations.

"Ne quid nimis."

ECONOMICS OF TUBERCULOSIS COLONIES.

AT the annual conference of the Tuberculosis Association, held in Oxford last week, a report of which will be found on p. 804, a session was devoted to a consideration of the tuberculosis colony and village settlement. The day has gone by when these institutions had to justify their existence on medical or sociological grounds. Almost every Continental text-book on the antituberculosis campaign contains an account of Papworth, and it is the proud boast of that pioneer colony that no child born and brought up in the village has so far developed tuberculosis, though born of tuberculous parent or parents. The products of the various industries from village settlements have further demonstrated a high degree of skill and workmanship. But a tuberculosis colony like every other institution nowadays must either pay its way or give good reasons why it does not. Dr. Bardswell puts the matter tersely at Oxford when he asked "Why has no public authority undertaken a settlement?" Various specious answers could be supplied to this question. Public authorities in this country do not make pioneer efforts, nor have they been charged with possessing imagination. But Dr. Bardswell himself supplied the true one: "The financial position has never been clearly put before them." Writing in 1924, Dr. F. N. Kay Menzies said: "I am not in a position to give you any accurate figures with regard to either the Papworth or Preston Hall Settlements, but it is probably fair to say that the capital expenditure in each case is not less than £250,000. Apart, therefore, from the heavy annual cost of maintenance, it is difficult to see how the erection of a number of such settlements by local authorities could be justified as a practical proposition." This statement has found its way into at least one American text-book, but we are not aware that it has ever been verified or disproved by accountant's figures. The colony has hitherto been widely regarded as a luxurious and expensive method of dealing with the problem of tuberculosis and one which no public authority can face. As Dr. McDougall, medical director of the British Legion Village at Preston Hall, said at the conference the failure to put the financial facts before the public had done more than anything else to discourage the progress of village settlements.

The facts as he gave them are these. When the British Legion took over Preston Hall in 1925 the total initial capital expenditure, as estimated by a competent firm of valuers, was £38,970. Since that date money has been spent on developments which bring the capital outlay up to a round figure of £100,000. Dr. McDougall emphasised the importance of making the financial returns of a colony under the three separate headings of sanatorium, estate, and industries. Only in this way can the financial position be properly understood. In the sanatorium section at Preston Hall the accommodation has been provided at a cost of about £178 a bed, which, even when allowance is made for the fact that much of it consists of hostels and huts, is exceptionally low. On the maintenance side, Preston Hall has been able, in spite of the inevitable fluctuations of the bed list, to preserve a financial balance by charging local authorities £2 12*s*. 6*d*. a patient per week. In 1927–28 there was a profit of £105 and in 1928–29 one of £195. In the estate section the average cost per settler's house has been approximately £403, and these houses are let at rentals varying from 4*s*. to 9*s*. per week inclusive of rates. Portions of the estate are also let to local farmers. The excess of income over expenditure on this section for the four years under review has been £978. In the industries section the total capital expenditure has been £17,544. At the moment, 145 settlers are earning their living at Preston Hall. The total sales during the four years period have realised £198,024; salaries, wages, and commission amounted to £66,160. The balance-sheet of this section shows an average loss per annum of £1080, or 1·8 per cent. on the turn-over. That is an average loss of £11 7*s*. 4*d*. a year per settler since the British Legion assumed control of the enterprise.

In our last issue Dr. E. L. Sandiland, medical superintendent of the East Lancashire Tuberculosis Colony at Barrowmore Hall, gave some figures illustrating the employment of ex-tuberculous patients in colonies, and showed that the breakdowns and time lost by the workers—2·2 per cent.—compared favourably with those in other communities. In spite of this, the colony has not yet reached the stages of a satisfactory balance. The last annual report of the colony states that there were then 25 settlers employed with a net loss in the industries section of £2479 18*s*. 8*d*. The Preston Hall figures suggest, however, that a loss in the industries section may be made up for by a profit in the sanatorium section, although at the moment there are no materials for a strict comparison between the losses on industries in one colony and those in another. Probably one of the advances likely to be made in the near future will be some agreed comparable system of keeping accounts. As time goes on, also, the size of a village settlement will presumably be adapted to the economic problem of the area it serves. Here the spade work done during the experimental years should prove invaluable. Dr. McDougall proposes accommodation for 200 patients in the sanatorium and 50 settlers in the industries section, and if such a ratio as this were found workable the hope of making ends meet with even a small margin for contingencies would be brought one step nearer. Be this as it may, it seems hardly fair at the moment to saddle the village settlements with all the responsibility of their deficits. Apart from the inestimable value of their work on the medical and sociological side, they contribute perhaps more than is realised to the relief of the burden of public authorities. Thus, Dr. McDougall pointed out that at Preston Hall one authority had at the present time 27 ex-patients in residence as settlers and the financial saving to that particular authority must be considerable. Again, there must be many tuberculous patients receiving more per annum from approved societies and disablement benefit than would be necessary to keep them at work as productive units in a settlement. And finally, the colony industries maintain their workers through bad times and good, and when, as recently at Preston Hall, untoward circumstances, such as a fire or breakdown in the works, throw the workers out of employment, they are not forthwith placed upon the dole, as they would be in many industries, but their maintenance is accepted as part of the liability of the industry. From the taxpayer's point of view, then, the colony is a better contribution to the tuberculosis problem than is often supposed. Colony finance has been described as robbing Peter to pay Paul; but Paul may prefer to be robbed by subsidising a man who can retain his self-respect by working four hours a day rather than by leaving him to be entirely unproductive. The immediate difficulties—namely, the capital cost of the settlement and the small percentage of the tuberculous population who are fit to avail themselves of its help—are enough to prevent public authorities from spending ratepayers' money in this way, but there seems no reason why the colonies, which are voluntary institutions, should not receive subsidies in proportion to the extent to which they relieve public authorities of their statutory obligations.

HEATING AND VENTILATION IN SCHOOLS.

In the severe weather of last year a number of elementary schools had to be closed on account of insufficient heating. This strange fact and others mentioned in the annual reports of school medical officers now coming in suggest that the problem of heating and ventilation in our school buildings is not yet completely solved. The first consideration in arranging a system of heating and ventilation must, of course, be the effect on the health of the school-children, although the cost of the method should not be unreasonably high. Complete guidance is not yet available but the introduction of the kata-thermometer by Leonard Hill has made it possible to assess the condition of the air in schools in respect of warmth, humidity, and cooling power, of which up-to-date authorities like those of Torquay have not been slow to take advantage. Another source of information is to be found in an inquiry [1] just completed by the Industrial Health Research Board which deals more particularly with the comfort and efficiency of the pupils, and how these were affected by the cooling power of the air and the distribution of the heat, especially vertically. In this study the temperature of the head, hands, and feet were measured by an extremely sensitive Moll thermopile. It is generally recognised that for health and comfort the head should not be warm and the feet cold; in one of their experiments Dr. Vernon and Dr. Bedford show a 12 per cent. loss of manual dexterity when the hands were too cold. Two recent methods of heating were found to be good; one, the warmed floor plan introduced by Mr. G. H. Widdows in the Derbyshire schools, the other the so-called panel system. The former recalls the old Roman hypocaust system, but in the new system the pipes contain water under low pressure, whereas the Romans used hot air; the latter method has large cast-iron panels placed near the ceiling also heated by circulating water. With the panel system the temperature of the room at all levels is nearly uniform; with the under-floor pipes the feet are kept warmer than the head, giving a greater sensation of comfort. The panel system has the special merit that the heating is almost wholly radiant, while in most others, including the under-floor plan, it is largely effected by convection.

Comparative estimates of the health of the children under the two systems were not made directly in this research. Something might be gleaned from the records of absenteeism in cold weather, which were much higher in the less warmed schools, but, as the authors point out, the children were usually kept away not by ill-health but by the restraining action of their parents. The investigators were concerned with open-air and other schools; they hoped to apply the information to factory life, but they realise that the conditions are not strictly comparable. In open-air schools warmth is less important than fresh air and light; great benefit has accrued to weakly children in schools with little means of providing artificial heat, and at Hayling Island the heating has been reduced to the simplest imaginable form of coke braziers on the beach. The report states:

"Observations on the hand temperature of 117 children attending three practically unheated open-air schools showed that at two of them the temperatures were about 5° higher than those shown by children in artificially heated schools at equal cooling powers. Probably this was due to the fact that the children were specially fed, were warmly clothed, and they sat at work for short periods only, alternating with periods of physical exercise. By means of canvas blinds the cooling power of the air at open-air schools can be reduced to less than half that experienced in unprotected sheds. Nevertheless, the efficiency of the children, in very cold weather, is only about half that of children in heated schools."

In factories an even distribution of heat is essential for mental and manual efficiency and the fact that the floor may be largely covered by machinery would rule out the under-floor system. For schools, the authors are inclined to think that the panel system is preferable to floor-heating except for open-air schools, but neither system is free from defect unless it embraces a small amount of hot-water radiators or pipe heating in addition to deal with the cold air from large windows. Useful rules suggested for the working of the heating (and associated ventilation) are that the temperature should not fall below 60° F. (or 55° as an absolute minimum) and the air never have a cooling power above 9°.

[1] A Study of Heating and Ventilation in Schools. By H. M. Vernon, M.D., and T. Bedford, Ph.D., assisted by C. G. Warner, B.Sc. Report No. 58. H.M. Stationery Office. Pp. 72. 2s. 6d.

HEALTH INVENTORY OF NEW YORK.

The Welfare Council of New York have issued a 400-page volume on the machinery that has been developed to promote the health of New York's six million citizens. The report is written by Dr. Michael M. Davis, now director of medical services for the Rosenwald Foundation at Chicago, and Mary C. Jarrett, formerly chief of social service at the Boston Psychopathic Hospital, and has been prepared with the coöperation of 300 organisations (including the municipal department) engaged in health work in the five boroughs which make up New York. New York will learn for the first time its needs for health services, and how these needs are being met, and no doubt the future of health work in the city will be influenced by the facts disclosed. These health services are rendered mainly by clinics, by the home visiting of health nurses and social workers, by various publicity agencies, and by hospitals and convalescent homes, which engage in preventive as well as curative work. There are 818 health clinics in the city (excluding those engaged in curative work), and of these 68·3 per cent. are maintained by privately supported health agencies, 17·5 per cent. by the municipality, and 14·2 per cent. by other official agencies. The 160 clinics which deal with the pre-school child, mental hygiene, heart disease, and cancer are all voluntary institutions. Dental, venereal, maternity, and eye clinics are mainly private agencies. Only in the field of infant welfare does the municipality maintain more clinics than the privately financed agencies. The municipality, however, has accomplished a great work in the coördination of the agencies dealing with tuberculosis. Out of about 2,000,000 home visits made by health agencies, 800,000 were paid by health department nurses. It is estimated that 2,000,000 dollars are spent in clinic services, and 2,000,000 in home nursing services annually, and it is thought that New York spends less per head in this manner than other large cities in the U.S.A. It is also estimated in the report that for every dollar spent in this prevention work, 18 dollars are spent in curative work.

In a preface to the report Mr. William Hodson, the executive director of the Council, and Dr. Neva R. Deardorff, director of its research bureau, show that this study has been made possible by grants from the Rockefeller Foundation and the Commonwealth Fund, and that it has been arranged in such a way as to parallel the inquiry made into the work of the municipal health department in 1926 by the American Public Health Association. They point out that the inventory is primarily a quantitative description of existing health services, and that no attempt has been made to study and deal with the quality or effectiveness of the service. Dr. C.-E. A. Winslow, head of the public health department at Yale University, contributes an interesting foreword. The inventory, he says, makes it clear that the machinery provided is still insignificant in comparison with the real needs, and that the voluntary agencies in particular have been developed with little reference to local needs. The great needs for the future are better provision for pre-school and school-children, and improved quality in infant welfare work. A grave shortage of hospital and sanatorium beds is a striking defect in the tuberculosis programme. The important rôle played by the hospital in the

development of clinic services of a preventive nature is highly significant. In nearly all fields coördination and standardisation of records and practices is called for, and there is an obvious opportunity to proceed further in the direction of generalised home visitation by a single district visitor in each neighbourhood. Dr. Winslow believes that future developments are likely to involve constructive leadership by the health department of a group of coöperative voluntary agencies rather than complete absorption of such activities in a tax-supported programme.

RELIEF OF BLINDNESS IN INDIA.

We print on p. 832 a letter from Lieut.-Colonel R. E. Wright I.M.S., professor of ophthalmology in the Madras Medical College, expressing a fear lest the leading article in our issue of Dec. 21st, 1929 (p. 1315), may create an incorrect impression concerning the relief of blindness and the teaching of ophthalmology in India. We are aware that the teaching of this subject in the large medical schools in India is now good; at Madras in particular the teaching is of a high order, for Madras has one of the finest eye hospitals in the world, and the University there has established a licence in ophthalmology while special ophthalmological centres have been started at other medical schools in the province and at Calicut. No doubt good work is being done elsewhere too; we mention Madras as detailed information happens to be available. The well-known work done in the past and still going on in the various Government hospitals and in other institutions did not come within the scope of our article, but it may be remarked that in the Madras Government Eye Hospital nearly 4000 in-patients and over 25,000 out-patients were treated during 1928. There, as in other centres, the number of in-patients was limited by the available supply of beds, and the total number of cases seen at Government hospitals and dispensaries alone must be enormous, irrespective of the other agencies. What we were trying to emphasise was that there is room for improvement in the treatment of trachoma, at least among the older medical men in India, and especially those who work in outlying dispensaries. Many of the latter are of the subassistant surgeon class, who in past years at least had a shorter course of training than the ordinary medical man, either in India or in Europe. The statement that the teaching in the ordinary medical curriculum in India (as in Europe) was scanty referred to the past, and an allusion to "refresher" classes in trachoma, given to qualified medical men practising in trachoma districts in Austria before the war, was coupled with the admission that the standard of teaching in ophthalmology in that country was high, expressly to avoid giving the impression that by suggesting such a course we were casting a slur on the present workers in India. Even in Madras, however, Colonel Wright himself has admitted that there is room for improvement in the treatment of trachoma.

"We try," he says,[1] "to impress on the students and post-graduates the undesirability of making a diagnosis of 'granular lids' because there is a liability for anything and everything to be diagnosed as granular lids by the average doctor and even by those with special training in ophthalmology. The result of this is that throughout the districts the more energetic forms of trachoma treatment such as rolling, grattage, and the application of strong irritant remedies is freely indulged in, in the treatment of cases which would probably get well if left alone or treated by some milder and non-irritating remedies."

In certain parts of India at least the actual treatment of trachoma, even when correctly diagnosed, is capable of improvement in may cases, judging by the results seen. It is still the cause of much blindness and defective sight, and a well-planned "refresher" course, or any other practicable method of improving the treatment, would be of inestimable value to the people of India. The diagnosis of trachoma involves an exact knowledge of conditions which may be mistaken for it.

[1] Report of the Government Ophthalmic Hospital, Madras, 1928, p. 17.

FRESH LIGHT ON INQUEST PROCEDURE.

THE considered judgment in Rex *v.* Divine, *ex parte* Walton, delivered by the King's Bench judges on March 17th, is the most important pronouncement on inquest procedure for many years. The office of coroner is marked by ancient traditions which Parliament has never completely standardised. The big Act of 1887, replacing a series of statutes going back as far as the thirteenth century, contained an express saving for "established jurisdiction, practice or procedure or existing usage," but this saving clause is naturally difficult to interpret, especially in view of local diversity of practice. For example, when a coroner has recorded the evidence of witnesses, must he read his notes over to them before they sign? Many coroners adopt this precaution, but the recent judgment in Rex *v.* Divine declares that they need not do so. If a coroner thinks there is uncertainty as to what the witness has said, or if the witness requests it, the coroner ought to read over the deposition and the witness may be justified in declining to sign until it is so read to him. But the statutory requirement, set out in Section 4 (2) of the 1887 Act, merely directs that the deposition be signed by the coroner and the witness, and the judges have now pointed out that to insist on any further requirement would be adding something beyond what Parliament enacted. Again, need a coroner, when permitting a jury to view some object outside the court (such as a damaged motor vehicle), allow the parties to be present whose conduct is in issue? The judges now rule that he is not obliged to give the parties this opportunity; the matter is one for his discretion. Should the coroner accompany the jurors on these occasions? The judges say he is not doing wrong if he goes with them, but it is "probably better that he should not." If he does go, he must be careful to abstain from discussion. The principle is that, when evidence has been given in open court, it is entirely wrong that further evidence should be given informally outside the court, or that anyone (even the coroner himself) should join with the jury in the discussions preliminary to their verdict. In Rex *v.* Divine, a review of proceedings at an inquest in Hull (already described in THE LANCET, Feb. 22nd, p. 426), a police constable, who had already given evidence in open court, joined the jury in their inspection and pointed out to them certain matters which apparently had a crucial influence on their decision that the motorist must have been travelling at a high speed. This, say the judges, was most improper. This important information should not have been given outside the court; the incident was good ground for quashing the inquisition. The judges' opinion here, however, seems to justify the comment that, if (as is a not uncommon practice in all courts) a jury is allowed to inspect some object or place outside the court, the coroner should accompany them, although the judges have said that it is probably better that he should not. Somebody must accompany the jury on these occasions; unless the coroner goes himself he cannot be satisfied that additional informal evidence or argument is not being surreptitiously conveyed to them.

An instructive passage in the judgment concerns the selecting of a coroner's jury. It appears that at Hull—as indeed probably elsewhere—there is a practice of using a severely limited panel of jurors for inquest. Eleven jurors were summoned out of a total panel of only 16 or 17 persons. This practice, in a great city like Hull, the judges describe as very objectionable. The principle of the jury system, they say, is the determination of facts by persons taken at haphazard from the body of qualified persons; it is a breach of that system to have a small panel of "regular jurymen." The judges could not definitely declare the system of summoning jurors at Hull to be illegal. No Act of Parliament requires the coroner to have recourse to persons on the voters list from which other

kinds of jurymen are drawn; the selection of a coroner's jury is largely in the coroner's discretion. Section 52 of the Juries Act of 1825 authorised coroners to continue to choose their jurors as theretofore accustomed. Indeed in itself the practice of using a limited list of jurymen is not necessarily reprehensible. The great Lord Mansfield, when laying down the broad lines of our mercantile law, is said to have relied habitually on certain merchants of proved aptitude and experience as his special jurymen at the Guildhall. Coroners' juries, as Hawkins J. once observed, must be brought together in haste and therefore cannot be summoned in the normal leisurely manner. The recent judgment is, however, a broad hint to coroners not to let their officers summon on every occasion the same handful of familiars. In this connexion the judges had to consider another point in the Hull proceedings. The coroner had, before the inquest, gone to view the damaged vehicle with a man who was one of the "regular jurymen" and was subsequently the foreman of the jury. The judges accepted the coroner's statement that no discussion of the causes or circumstances of the accident then took place, but they declare the incident to have been an irregularity which would technically have been "misconduct" even at common law and which justified the quashing of the inquisition as a course "necessary or desirable in the interests of justice" within the extended powers of the High Court under Section 19 of the amending Act of 1925.

It was not really needful that the High Court should have examined into the several matters of alleged irregularity in the Hull proceedings. Fresh evidence had become available since the original inquest had been held, and on this ground alone the High Court decided (a month earlier) that a new inquest should be held. No reflection was made upon Dr. John Divine, the coroner for the city and county of Kingston-on-Hull; an attack upon his summing-up was held not to have been substantiated. Having become aware of the allegations of irregularity, the High Court had to take notice of them; thus, after summarily ordering a new inquest on the ground of the fresh evidence available, the judges took time to consider the other aspects of the case in the postponed judgment lately delivered. There is no need to dwell further upon the ancient and peculiar usages of the coroner's inquest, the wider terms of the oath administered to the coroner's jury, or the other matters which differentiate the inquest from the ordinary forms of criminal procedure. Clearly, any practices which damage the credit of the inquest as a judicial tribunal either in the eyes of the High Court or in public opinion will, if persisted in, challenge the continued existence of the office of coroner. A practice may not be forbidden by statute and yet may be open to considerable objection.

LIVESTOCK IMPROVEMENT.

Prof. F. A. E. Crew, addressing the Royal Society of Arts on April 9th, stated that the lag between demonstrated scientific fact and its incorporation into practice was usually about 20 to 50 years. It is, he said, of the first importance that genetical methods with a scientific foundation should be applied to livestock as quickly as possible if the country is to recover from the present depression in agriculture. A number of factors combine to hinder the development of comprehensive breeding schemes at present, not the least is the financial insecurity in which agriculturists are involved: they literally have not the capital to attempt new methods. Then, traditional wisdom is not readily shaken by new theories, and breeders will not reconsider lightly their old practices. Prof. Crew emphasised the need for establishing a standard of excellence at which breeding should aim, and this is not a simple matter. Sheep breeding, to take an instance, must aim at the production of good mutton as well as good wool; but the fleece of the more thriving sheep is not necessarily the best in the wool market; it is important to decide what qualities must receive primary consideration. The habitat will also demand variations in the ideal type. Ignorance among the stock-breeders is responsible for many fallacies in present methods. Prof. Crew mentioned "those who sell the quickest growing sows and keep the slowest for further breeding, not knowing that the economical conversion of food into pig is an inherited character, and that the quickest growers are the most economical feeders." These, and similar mistakes, he considers can be avoided by the application of genetical methods by the breeders themselves, but this cannot be accomplished without better education of the breeders. Ability should be rewarded, but not as at the present agricultural shows, where emphasis is too often laid on the wrong points. He thinks that too much weight is given to pedigree and too little to the milk record, the bacon quality, the pulling power, the egg and the fertility records. The waste resulting from existing methods is not easily assessed, but he stated that 40 to 50 per cent. of all mares put to the stallion each year fail to produce a foal, and that about 50 per cent. of unfertile matings are due to genetic causes; sterility can be bred into a stock, and it is as important to breed for fertility as it is for any other valuable quality, a point too little realised at present. He concluded with some interesting suggestions on the potentialities of laboratory experiments if applied to agricultural stock. Ductless gland therapy might be used to determine the rate and limit of growth, the duration of lactation, the deposition of fat, and other qualities at present obtained only by the slow process of selective breeding. Research which has been carried out successfully on rats and mice promises to give the same valuable results with agricultural stock if the opportunity is forthcoming.

LOCAL SEQUELÆ TO RADIUM TREATMENT.

THE fact that radium has a more lethal effect on malignant cells than on normal ones is now generally assumed to be the basis of the treatment of cancer by this powerful agent. There are many other disorders, however, in which it is sought to profit by the differential action of radium on various types of non-malignant cell. One of the methods of studying the differential action of radium is to make careful observations of the nature of the local sequelæ to its use. Mr. N. Asherson [1] has noted among the 226 patients treated for non-malignant conditions at University College Hospital during the period 1921–28 the following sequelæ: (1) annular (hour-glass) constriction of the vagina; (2) atrophy of the portio vaginalis of the cervix; (3) shortening and stenosis of the vagina; (4) ovarian neuralgia. Up to 1927 the average dose of radium treatment per patient with a non-malignant pelvic condition was 1200–1800 mg.-hours, but during 1927 and 1928 bigger doses (above 2000 mg.-hours) were given in many cases. It was with the advent of these big doses that certain sequelæ came to light, mostly in women over 40. Among more than 200 cases treated with radium during the years 1921–27 annular (hour-glass) constriction of the vagina was not once observed, but it was found in two out of ten cases treated with doses varying from 2500 to 3000 mg.-hours of the element in 1927–28. In both cases this condition, which was detected within three to four months of the treatment, was associated with complete atrophy of the portio vaginalis of the cervix. The mucous membrane of the vagina was normal. The constriction, situated about one inch from the introitus, was apparently a fibrous ring which yielded slightly to firm pressure. Atrophy of the portio vaginalis of the cervix has been frequently noticed by Mr. Asherson in the routine examination of patients followed up. This atrophy may, however, be only apparent, depending on changes in the uterus and vagina. Complete obliteration of the vagina by

[1] Jour. of Obstet. and Gyn. of the Brit. Emp., 1930, xxxvii., 84.

total stenosis and shortening of the vagina has been observed only in inoperable cases of carcinoma of the cervix, never in non-malignant cases, but chronic purulent and adhesive vaginitis have occurred. "Neuralgia" radiating from over both ovarian regions down the inner side of both thighs to the knee was complained of by one patient, whose general abdominal pain had ceased after radium treatment. One radium burn of the vagina was ascribed to the slipping of the radium tube. Mr. Asherson adds that no case of malignant disease has been recorded in a patient subjected to radium treatment for menorrhagia.

An extended experience in examining cases treated by radium has convinced him that the sole therapeutic action of radium—whether in non-malignant or malignant cases—lies in its being a stimulator and producer of fibrous tissue, and he claims that this theory is supported by the sequelæ observed. He suggests that should there be a few malignant cells, as in an early case, a big dose of radium producing much fibrous tissue may strangle all the malignant cells and so bring about a cure. Should some of the cells escape the effects of this fibrous tissue they will multiply and then overcome the fibrous tissue, and when this resistance is finally overcome the growth extends rapidly to its fatal issue. It is curious that in spite of the widespread use of radium the mechanism of its action is still a matter of dispute.

THE ACQUITTAL OF ETHYL PETROL.

WHEN an enterprising firm put on the market of this country a motor spirit containing a small quantity of tetra-ethyl lead, they encountered a considerable body of opposition. Alarm was expressed freely in the press and in Parliament lest the new fuel should liberate, if its use became general, a sufficient quantity of lead to endanger the health of the public, and the popular suspicion thus fostered had the unfortunate result of compelling the manufacturers to cease distribution before the question could be determined scientifically. The Minister of Health set up in April, 1928, a Departmental Committee which published an interim report in July of that year,[1] but their provisional findings, though favourable, were not sufficiently positive and did not attract wide enough publicity to counteract the popular prejudice against ethyl petrol. The final report of the Committee[2] states in the most conclusive terms that the general use of ethyl petrol—we are not concerned in this country with the manufacturing hazard—would involve no danger to public health whatever. Their experiments have proved that the quantities of particulate lead in the atmosphere would not be great enough to endanger the health even of drivers and of policemen on point duty. The ordinary London dweller inhales about one-tenth of a mi ligramme of lead in a day; the lead inhaled even by those most exposed would not exceed twice that quantity and would still be negligible as a source of danger. Moreover, the hazard from exhaust gases and spillage in a well-ventilated garage is equally minute, and even in badly ventilated garages is not serious; probably nothing like as serious as the risk of poisoning from the carbon monoxide which is common to the combustion products of all fuels. Even those whose skin would be constantly exposed to the liquid would undergo no danger, for it caused no ill-effects whatever even when applied continuously to the shaved skins of rabbits for four months. These results agree with those obtained in America, and amount to a discharge of ethyl petrol without a stain on its character, although, to make assurance doubly sure, the Committee recommend that the fuel shall continue to be dyed, that all cans and pumps containing it shall be labelled, and that the amount of lead tetra-ethyl should not exceed 1 part in 1300 by volume or 650 by weight. It remains to be seen whether, with this evidence at their back, manufacturers will reintroduce ethyl petrol. It undoubtedly has certain advantages and seems to harm engines as little as man, though its outstanding merits are chiefly apparent in engines with a much higher compression ratio than those of the ordinary motor vehicle. These are the points of interest to the motorist, but the report contains a wealth of accurate information (summarised on p. 826) on the apparent universality of lead, when sought by delicate tests, and on the processes of absorption and elimination which will engage the attention of the toxicologist and medico-legal expert.

[1] Cmd. 3159.

[2] Ministry of Health: Final Report of the Departmental Committee on Ethyl Petrol. H.M. Stationery Office, Adastral House, Kingsway, London, W.C. Pp. 91. 1s.

THE SAFEGUARDING OF VOLUNTARY ASSOCIATIONS FOR MENTAL WELFARE.

WHEN the Local Government Act, 1929, came into force on the first of this month, the care of mental defectives was handed over to county and county borough councils. In this connexion the Ministry of Health have circulated a three-year scheme whereby the invaluable coöperation of voluntary associations concerned with the welfare of defectives can be retained by the new authorities. The Minister suggests that every Council shall pay two annual contributions—one to the local voluntary association and one to the Central Association for Mental Welfare. The amount of the contributions is prescribed by the schedule, and is to be paid in quarterly instalments. The efficiency of the local associations is made a condition of their grant, and is to be judged by the council who make it, while that of the central association is to be judged by the Minister. Local councils are entitled to inspect the premises and services of the local associations and to receive a copy of the annual report and statement of accounts. Except on the ground of inefficiency, no councils are entitled to terminate or reduce their annual contribution without the consent of the Minister. The contributions to the central association have been based on the Board of Control's direct grant of £2000 for the standard year and apportioned between the various local authorities according to population. By Section 106 of the Act local authorities can request the Minister to pay their contributions direct to the central association and, in view of the obvious inconvenience in collecting small sums quarterly, the Board of Control hope that all local authorities will take this course. The purpose of this scheme is to protect the voluntary associations under the new system; the amounts of the contributions may be varied from time to time, and local authorities can make further contributions if they wish to. The value of the voluntary work carried out in all parts of the country is so indisputable that it is to be hoped that the new organisation will in no way hinder its development.

THE house and library of the Royal Society of Medicine will be closed from Thursday, April 17th, to Tuesday, April 22nd, both days inclusive.

Summer Time will commence in Great Britain, Ireland, the Channel Islands, and the Isle of Man on Sunday morning next, April 13th, at 2 A.M., when the hands of timepieces should be advanced one hour. It will end on Sunday, Oct. 5th. France and Belgium will make the change at the same week-end, Holland on a date in May, while Spain has not definitely decided but will probably not adopt it at all this year.

Mr. Harry Percy Adams, who died on Monday in Westminster Hospital, was a great architect of hospitals. Head of the firm Adams, Holden and Pearson, which designed the new Royal Westminster Ophthalmic Hospital and is executing the large modern hospitals at Constantinople and Malta, he was assessor for the new Birmingham Hospital Centre which produced the admirable design recently printed in our columns. Hospital patients will have reason to remember Mr. Adams with gratitude, for it was he who introduced into this country the lengthwise lay-out of wards which combines comfort with privacy.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LXVII.—BACTERIAL BLOOD CULTURES.

IN many protozoal infections, such as malaria, parasites appear in the blood in such numbers as to be readily recognisable in a film. Few bacterial blood infections can ever be recognised by this simple technique, although very occasionally, as a terminal event, stained blood films show organisms in such infections as staphylococcal septicæmia. Cultural methods are therefore essential for the effective diagnosis of septicæmic infections in general.

It is generally accepted that the circulating blood of a healthy person is sterile. Organisms must constantly enter the blood stream, but in a state of health the bactericidal power of the blood, and the filtering property of the reticulo-endothelial system, almost instantaneously kill and remove them. It is probable that, even in severe septicæmia little actual multiplication of organisms takes place in the circulating blood. But a "positive" blood culture is usually evidence of a severe generalised infection and bears a correspondingly grave interpretation.

The terms "septicæmia" and "pyæmia" are in common use. There is little real distinction between them. Both imply a deficient bactericidal power of the patient's blood and reticulo-endothelial system; the formation of metastatic abscesses, known as pyæmia, is often a late stage of "septicæmia," and on the whole a sign of satisfactory local reaction. The terms are relics of the early days of bacteriology and will probably be abandoned in the future.

Indications for Blood Culture.

Blood culture is indicated in any case of unexplained pyrexia. Even with our present inadequate methods a surprisingly large number of positive blood cultures would be found if such examinations were more frequently made. The following list suggest certain appropriate cases for this investigation: (1) Patients with valvular lesions of the heart, with a temperature failing to react to salicylates. (2) Patients in the puerperium, with an unexplained temperature over 101°F. persisting more than 48 hours. (3) Patients with skin wounds, however slight, with a temperature over 101° especially if rigors are present. (4) Patients with severe sore-throats and rigors. (5) Patients recovering from surgical operations where a high temperature persists for more than 48 hours and exceeds 101°. (6) Any patient with a rigor, unless there be an obvious explanation (e.g., malaria, serum sickness). (7) Patients suffering from acute infections of the middle ear, including acute mastoiditis. Many patients with rigors, in whom blood cultures are not systematically performed (such as those passing urine per vias naturales after prostatectomy), will be found to give positive blood cultures if examined during the rigor.

It will be noticed that a temperature of 101° has been selected as a crucial one. This does not imply that all patients with this temperature are likely to have septicæmia, but it does imply that until that point is reached and in fact until the temperature reaches 103°, positive results are improbable.

Methods of Culture.

It is essential to recognise that while a positive blood culture is significant, a single negative culture is of no value. Even in severe septicæmia only a very few organisms are present per c.cm. It is therefore necessary to take the cultures under optimal conditions, of which the most important is that the temperature of the patient should be at its height, or on its upward curve. Positive cultures are most likely to be secured, for example, during a rigor. Study of the temperature chart will show that at some period, usually at night, the temperature is highest, and such occasions should be selected. Exceptional cases of septicæmia, usually severe if not fatal, are occasionally encountered in which the patient fails to react at all to the infection and temperature does not rise. But the majority of blood cultures taken in afebrile states are sterile.

The sterilisation of the skin is of great importance. Blood is most readily taken from the median basilic vein and the skin must be thoroughly cleaned with ether and painted with iodine.

The most satisfactory cultures are those taken at the bedside by a pathologist, the blood being directly introduced into the culture media. If this is quite impossible, blood may be taken, either with a syringe sterilised in boiling methylated spirits or by a Wassermann needle, into a sterile tube with a sterilised rubber plug. A tube (the "Behring venule") fitted with a needle, and already sterilised, is on the market, and blood is withdrawn into this through the agency of a partial vacuum. This is quite a satisfactory arrangement for the transmission of blood for culture. Coagulation may be prevented by a trace of potassium oxalate, or a ½ c.cm. of Liquor Trypsin Co. (A. and H.) previously sterilised by filtration. Citrated blood is useless owing to its alkalinity. The blood can then be sent by post for culture, but results are less reliable, if negative, than those in which the blood is directly applied to the culture media. The culture even of blood-clots, however, is often of value, especially in enteric fever and malignant endocarditis.

Not less than 10 c.cm. of blood should be taken at any examination, and it should be sown in a selection of liquid media. Solid media are as a rule useless. It must be stressed that the culture of a few drops of blood from a patient's ear or finger is quite useless. In order to prevent coagulation trypsin solution is of great value. Bile-salts similarly prevent coagulation and are useful in enteric fever and similar diseases, but inhibit the growth of some bacteria. Among the best media are glucose broth and distilled water. Cultures are grown both aerobically and anaerobically, the bulk of medium being always at least five times as great as that of the blood. A positive culture is evidenced by turbidity and change of colour of the medium. Cultures are examined daily, and no culture is deemed sterile until at least 14 days have passed.

Results of Culture.

Contaminated cultures are common, the organisms being derived either from the skin or the air. From the skin staphylococci and diphtheroid bacilli are commonest, and from the air organisms of the subtilis group. Of these only the *staphylococci* present difficulties; if only one tube of a serum contains the organism, and if the organism is of the "albus" type the cultures are usually held to be contaminated. Staphylococcal septicæmia is by no means uncommon, and blood cultures taken in the early stages of acute bone infections consistently give evidence of it. It is also frequently met with in severe infections of the subcutaneous tissues. But it is as well to withhold judgment if no organism other than the staphylococcus is demonstrated. Streptococci, on the other hand, are always to be accepted as evidence of blood stream infection, and are, with the typhoid group, the organisms most commonly found. Influenza bacilli, gonococci, and indeed nearly all recognised pathogenic organisms have at some time been reported, but are all in varying degree exceptional.

The discovery of organisms of the *enteric* group means that the patient has typhoid, or other analogous fever, cultures taken within a week of the onset of symptoms being regularly positive. They are probably the easiest organisms to grow from the blood stream, *B. typhosus* being easier to recover than members of the Salmonella group. Even within the first 48 hours of the illness positive cultures may be obtained, and, contrary to statements sometimes made, positive

cultures are obtainable so long as the temperature is raised; the likelihood of success diminishes after the first 14 days. Negative blood cultures at no time exclude these infections, and the importance of a white cell count, showing leucopenia, and an agglutination test after the first ten days, must not be forgotten.

The growth of *pneumococci* in pneumonia has no important clinical significance beyond confirming the diagnosis. In lobar pneumonia most authorities find that about 30 per cent. of cases give positive blood cultures, and it is suggested that these are more frequently found in the more severe cases. There is no general agreement on the question as to whether lobar pneumonia is a septicæmia which becomes localised, or a pulmonary condition with an overflow into the blood. Pneumococci are also occasionally found in blood cultures of subacute infective endocarditis, and in septicæmias following operation and post-mortem wounds.

Streptococci in the Blood.

The recovery of streptococci from the blood is of the greatest importance, and in a patient with a valvular lesion of the heart almost invariably implies the fatal diagnosis of malignant endocarditis. Few bacteriologists claim to have secured positive blood cultures in simple rheumatic endocarditis. In subacute malignant endocarditis the organism is usually *Streptococcus viridans*, and in the more rapidly fatal cases hæmolytic types are found. A hæmolytic organism therefore bears a worse prognosis. If no valvular lesion is recognised and streptococci are found, the diagnosis is one of septicæmia, and the prognosis again depends to some extent on the nature of the organism, since the hæmolytic strains are as a class the more dangerous. The localisation of infection in deep abscesses should be looked for, and is of good omen; but incisions, whether blood cultures are positive or negative, should never be practised until pus is beyond question present. It is quite common for large swellings to appear and disappear many times before true localisation occurs.

If a hæmolytic streptococcus is present, treatment with antitoxic sera is urgent and essential. There is as yet no final evidence as to the specificity of hæmolytic strains, and in this country the use of scarlet fever antitoxin has been found satisfactory in cases both of puerperal and other streptococcal septicæmias. While intravenous injection is, as a rule, harmless, it always causes rigor, and the intramuscular route is preferable. At least 30 c.cm. should be given in one dose, and up to 100 c.cm. may be given without fear of bad results, and repeated daily. Such heroic doses may appear excessive, but recovery has been observed in apparently hopeless infections when they are employed. In pneumococcal septicæmias therapeutic sera are also available, and in the hands of many authorities have yielded good results. In the rare cases of meningococcal meningitis the appropriate serum should always be used.

In septicæmias other than these there is no indication for specific treatment at present. The use of arsenobenzol derivatives, of mercurochrome and mercuric chloride, to mention only a few suggestions, has been advocated. But at present no satisfactory measures are available. The value of blood transfusion in any case of septicæmia is often very great. Experience suggests that it is desirable to test donors' cells directly against patients' serum, and not to rely on a "universal donor" in cases of septicæmia.

Finally, it may be stressed that at least three attempts should be made to procure a positive blood culture before septicæmia is excluded, and that this is particularly important in malignant endocarditis, where even under the best conditions by no means every case gives a positive result. Patients with chronic valvular lesions may become malingerers, and a succession of negative blood cultures with a high temperature in such patients suggests a careful watch over the taking of temperatures. On the other hand, if blood cultures show, over a period of weeks, a growth of streptococci on repeated examination, particular attention should be paid to the heart as malignant endocarditis becomes, with passage of time, a more and more inevitable diagnosis.

R. J. V. PULVERTAFT, M.B., M.R.C.P.,
Pathologist to the Medical and Surgical Units, St. Thomas's Hospital; Plimmer Research Fellow in Pathology.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdr. R. W. Nesbitt is promoted to the rank of Surg. Comdr.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Sub-Lt. J. E. L. Morris to be Surg. Sub-Lt.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. M. C. Beatty, having attained the age for compulsory retirement, is placed on retd. pay.

Temp. Lt.-Col. T. S. Blackwell to be Lt.-Col., vice Lt.-Col. W. J. Weston (decd.).

Temp. Lt.-Col. H. E. Priestley to be Lt.-Col., vice Lt.-Col. M. C. Beatty, retd. pay.

Maj. and Bt. Lt.-Col. C. M. Drew to be temp. Lt.-Col.

Maj. D. Pottinger retires, receiving a gratuity.

Maj. A. S. Littlejohns to be temp. Lt.-Col.

ARMY RESERVE OF OFFICERS.

The undermentioned, having reached the age limit of liability to recall, cease to belong to the Res. of Off.: Lt.-Col. P. C. Douglass and Maj. J.. M Cuthbert.

TERRITORIAL ARMY.

Maj. H. C. Sands retires on completion of tenure of comd. and retains his rank, with permission to wear the prescribed uniform.

W. F. Dorward (late Cadet, St. Andrews Univ. Contgt., Jun. Div., O.T.C.), E. Hutcheon, and E. J. Fitzgerald to be Lts.

INDIAN MEDICAL SERVICE.

Lt. G. G. M. Davis relinquishes his prob. appt.

The undermentioned officers relinquish their temp. commns.: Capts. K. Ram and S. M. A. Khan.

COLONIAL MEDICAL SERVICES.

The following appointments have been made:—Dr. M. A. Minahan, Lady Medical Officer, Federated Malay States; Dr. W. T. M. Gilbert, Medical Officer, Nigeria; and Dr. T. S. Dalrymple, West African Medical Service.

PAYMENTS TO A MEDICAL STAFF.—In view of the increase in the number of patients since the establishment of a contributory scheme, the board of management of Warrington Infirmary decided that "it is only reasonable and fair that a proportion of the Contributory Fund should be paid over to the members of the medical staff," and the proportion was fixed at 10 per cent. In view, however, of the recent heavy expenditure upon additions and alterations the medical staff decided to return 25 per cent. of their total for 1929. The medical board report that the accommodation is still altogether inadequate.

HOSPITAL WORK IN THE DOMINIONS.—The Volkshospitaal, the nursing home of the Dutch Reformed Church at Cape Town, which has cost £54,000, has recently been formally opened. The ceremony was performed by Princess Alice, Countess of Athlone, who made a speech in Cape Dutch.

The Alberta Medical Caravan is about to begin its annual tour among the lonely farming communities of the Canadian West. The caravan consists of several specially equipped lorries, containing a complete hospital outfit, a dispensary, and a dental clinic, and the personnel is formed of two surgeons, two dentists, and four nurses. Each stopping place is notified in advance, the patients assemble there from the surrounding districts, and the caravan remains until all the patients have been disposed of. Last year more than 4000 examinations were made, 1408 operations were performed, and 4273 dental cases received attention.

Special Articles.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

THE JUBILEE CONGRESS.

THE Jubilee Congress of the Society took place on April 3rd, 4th, and 5th, at the house of the Royal Society of Medicine, under the presidency of Mr. LESLIE PATON.

The PRESIDENT presented the Nettleship Medal to Miss Ida Mann for her investigations into the embryology of the eye, commenting on the excellence of her work in this field during the last ten years, and proceeded to deliver his Presidential Address on

SOME OF THE FACTORS CONTROLLING THE POSITION AND MOVEMENTS OF THE EYES.

He dealt mainly with the part played by the labyrinth and the proprioceptive impulses from the neck muscles in the control of the position and movements of the eyes. In man and animals with frontally placed eyes the retinal stimuli had a predominating place in the control of the position and movements of the eyes, and in such animals it was only possible to get good evidence of the importance of other lower dyscritic controls when the higher epicritic retinal controls were either removed or damped down. But the other factors were constantly present and in action, and when their functioning was interfered with important symptoms and signs were produced. The lower controls, as a rule, did not rise to the level of consciousness, and the cerebral cortex was not necessarily involved in the path of their arc. It was different with the retinal control, and, certainly in respect of the visual fibres, this was epicritic.

Mr. Paton described the unceasing control exercised on the position and movements of the eyes by the labryinthine organs and by the reflexes from the movements of the head relative to the trunk. This control was definitely connected with the mechanism for the maintenance of general body equilibrium and of muscle tone, also with that of hearing; and this association produced a complexity of structure in the central nervous system which it was difficult to unravel. He sought to make two points in respect of labyrinthine control: (1) the constant nature of this control; (2) the fact that the basic nature of the end organ involved remained unchanged, structurally and functionally, throughout the animal kingdom; it was throughout a sensory organ, responding to variations in pressure. In all cases the activity of the sensory cells varied inversely with the pressure on them—i.e., the lower the pressure the greater the activity. The reflex connexion of the labyrinths with the eye muscles was obviously a very direct one, but it could also be shown that the effect produced was the result of the summing up of the effects of the two labyrinths, so that when one was destroyed the remaining one only produced half the effect. Mr. Paton proceeded to discuss the functions and connexions of the sacculus and the utriculus, and showed that the maculæ utriculi were linked up with the oblique muscles, and each utriculus was linked up with all four obliques. It was clear, he said, that the utriculus must link up with the superior and inferior recti. When a monkey was placed face downwards, both eyes looked upward; when it was placed on its back, both eyes looked down. He went on to speak of the semi-circular canals and the cristæ ampullæ and their respective functions. He said that the nystagmus which resulted from destruction of a labyrinth lasted only a few days. The labyrinthine control of the position and movements of the eyes was only a small part of the labyrinthine function in maintaining muscle tone and body equilibrium generally. A recognition of the complexity of the problem and of the number of gaps in knowledge might stimulate the filling of these gaps. It was essential to have a better understanding of nystagmus and of some of the more obscure forms of ocular palsy and ocular disturbance.

Delegates from the United States, France, Holland, Spain, Italy, Norway, Sweden, Austria, and Belgium congratulated the Society on the attainment of its Jubilee, and presented an ivory presidential mallet, inscribed in enamel.

Mr. E. TREACHER COLLINS read a paper entitled

The Harderian Gland—Xerophthalmia; Vitamin A Deficiency; Keratomalacia.

His deductions from the detailed evidence he brought forward were as follows: (1) the eyelids and para-ocular glands had been developed in animals living in an aerial environment to protect their eyes from foreign substances, and to prevent their corneal epithelium from undergoing keratinisation; (2) the lacrymal secretion acted mainly as an irrigating antibacterial fluid; (3) the mucous secretion of the Harderian gland preserved the corneal epithelium from keratinisation in the animals in which it was present; (4) the disappearance of the Harderian gland in primates was compensated for by an increased development of unicellular mucous glands in the retrotarsal folds and ocular conjunctiva; (5) in animals fed on a diet deficient in vitamin A the Harderian glands soon became atrophied and ceased to function, and in the absence of their secretion the epithelium of cornea and conjunctiva showed keratinisation; (6) in human beings on a deficient vitamin A diet the mucous secreting cells of the conjunctiva atrophied, and keratinisation followed; (7) keratinisation might affect the ducts of the lacrymal and meibomian glands, so that they became secondarily involved; (8) in the absence of its mucous secretion the surface tension of the conjunctiva became altered, so that the fatty secretion of the meibomian glands adhered to it, and this secretion formed an excellent medium for micro-organisms; the pathogenic ones excited an inflammatory reaction which, in the cornea, resulted in keratomalacia. Inability to see in a dim light after exposure to a bright light, a symptom frequently met with in association with xerophthalmia, had been produced in rats by a diet deficient in vitamin A, and was found to be accompanied by a marked delay in the regeneration of the visual purple. Further, xerophthalmia was frequently accompanied by pigmentation of the conjunctiva in dark-skinned races of mankind and animals. A 1 per cent. aqueous solution of mucin suitable for application to the eye could be prepared from the desiccated Harderian glands of sheep by the use of sodium hydroxide.

The afternoon sitting on April 3rd was devoted to a discussion on

Disorders of Secretion of the Endocrine Glands Associated with Eye Diseases.

Mr. J. H. FISHER, in opening the discussion, spoke of the complicated interacting mechanisms which controlled the carbohydrate metabolism of the body, and said that in spite of these complexities the ophthalmic surgeon seemed satisfied, when sugar was found in the urine, that he understood the ætiology of the case. In fact many endocrine glands might be playing a part in such a case, and there was great need for the biochemist and physician to come to the aid of the ophthalmologist. Myasthenia gravis had been described in association with hyperplasia of the thymus, with congestive enlargement of the parathyroids, and with exophthalmic goitre. That it might be due to some disturbance of endocrine glands was also suggested by the fact that in women the condition improved if pregnancy occurred. Thyroid extract had been used in its treatment. Osteomalacia attacked both sexes, and in the female was aggravated by pregnancy. Myxœdema was well controlled by organotherapy. This disease did not lead to lens changes; if cataract occurred after excision of the thyroid gland, it was probably due

to simultaneous removal of the parathyroids. The endocrine glands were factories, each turning out its special product which was essential to health. Mr. Fisher suggested that in cases of endocrine disorder the biochemists should investigate to the uttermost the constitution of the blood, from which alone the ductless glands drew their pabulum, and into which they poured their products.

Prof. H. MACLEAN discussed the connexion between glycosuria and eye changes.

Dr. W. CLARK SOUTER, Prof. E. C. DODDS, Mr. A. W. ORMOND, Mr. CHARLES GOULDEN, and Prof. MELLER (Vienna) also spoke.

Among many interesting papers and demonstrations was one by Mr. W. S. DUKE-ELDER, who gave by means of a series of slides some observations on the

Physiological Action of the Extra-Ocular Muscles.

He gave an account of experimental work he had been doing in order to show the effect of choline and acetyl-choline on the extrinsic muscles of the eye. The matter arose, he said, during a research upon the effect of various drugs upon the extra-ocular circulation, when peculiar reactions upon the intra-ocular pressure were registered with choline. The extrinsic muscles of the eye differed from muscles elsewhere in the body because their fibres were exceptionally fine and delicate, and it might be that their permeability was so great, owing to their fineness, that choline could diffuse in them. The reaction which took place with choline was traced to a contraction of the recti and obliques which was unaffected by atropine and was abolished by nicotine and curare. Mr. Duke-Elder pointed out that this reaction corresponded in every way with the phenomena described by Vulpian as occurring in denervated tongue muscle, and by Sherrington in denervated skeletal muscle, where pseudo-motor contraction of this order was obtained either by the stimulation of the sensory or vaso-dilator nerve-supply, or by the injection of choline. This peculiarity in the physiological action of the extrinsic muscles of the eye, that is, behaviour corresponding to that of denervated voluntary muscle elsewhere, was discussed by Mr. Duke-Elder in relation to the peculiarities of the sensory innervation of these muscles, and the curious anatomical features of the muscle-fibres themselves.

Dr. W. R. AYKROYD read a paper on

Functional Night-Blindness due to Vitamin Deficiency.

He said this recurrent difficulty in adapting the eyes to dim lights had been thought to be due to vitamin deficiency for several reasons. It occurred in association with a poor diet, was rapidly curable by giving cod-liver oil or mammalian or bird's liver, and was often noted in conjunction with external eye conditions similar to those produced experimentally in vitamin A-deficient animals. But the ætiology of the disease could not be regarded as established beyond question. He described the following observations made in Newfoundland and Labrador last summer. The diets of a series of cases of hemeralopia were found to be obviously deficient in vitamin A. In some patients the disease developed in less than a month after the patient had passed from a diet rich in vitamin A to one which was almost devoid of it. The conditions of the country, and the mode of life followed by the people made it difficult to obtain food containing vitamin A. All the cases were curable in 24 to 48 hours by one or two doses of cod-liver oil. Two fishermen had cured themselves by eating half a seagull's liver raw. Strong sunlight, however, played a part in the causation of this functional night-blindness; men exposed for long periods to sunshine in open boats were the chief sufferers. Women and children were rarely attacked by it. However, normal people did not develop the condition, whatever their exposure to the sun. In women, hemeralopia was usually associated with pregnancy, and tended to clear up spontaneously. Delay in the regeneration of the visual purple would account for the observed clinical facts. Hippocrates was aware of the "liver cure" for night-blindness. For this particular functional form the term "nutritional dysskotopia" had been suggested.

Mr. FRANK JULER read a paper entitled

Some Cases of Damage to Descemet's Endothelium.

He quoted the words of Friedenwald in his recent book on the pathology of the eye: "The influence of Descemet's membrane on the nutrition of the cornea is entirely unknown, for the membrane and the lining endothelium combine to form a barrier against the passage of fluid and of substances in solution, from the anterior chamber into the cornea. When the endothelium is injured, the barrier becomes imperfect and œdema of the cornea results, which manifests itself (1) in the formation of blebs under the epithelium, (2) in a general milky haze of the cornea, (3) in the development of folds in Descemet's membrane." Mr. Juler's experience supported this statement. He described cases of (1) œdema of the cornea from a fragment of glass free in the anterior chamber, (2) corneal opacity resulting from irrigation of the anterior chamber in process of cataract extraction, (3) epithelial dystrophy of the cornea in two sisters. With regard to the second of these cases, the dangers of irrigation, apart from possible infection, were (1) loss of vitreous, and (2) the use of solutions of incorrect concentration or irritant action. These solutions must not be used too hot or under too great pressure. There was also (3) a danger of damaging the back of the cornea with the nozzle of the irrigator, the latter being especially to be avoided when there was recent damage to the endothelium.

THE GENIUS OF WILLIAM BOWMAN.

The Bowman Lecture was delivered by Sir ARTHUR KEITH, F.R.S., who began by relating an incident which gave an intimate view of Sir William Bowman's personality. James Syme, when Regius Professor of Clinical Surgery at Edinburgh, had publicly condemned the operation of iridectomy for the relief of acute glaucoma in 1857, and Bowman wrote him a personal letter stating that he found it the only certain and indispensable treatment for the condition. He did not himself rush into print, though eventually Syme sent the correspondence to the *British Medical Journal* in which his attack on the operation had appeared. Bowman made brilliant discoveries in anatomy in his youth, and in his full tide he did more than any other man in the domain of ophthalmology. Before he was 25 Bowman had advanced medicine by a series of notable discoveries; he had very rare gifts of mind, and he must have had some missionary quality which urged him on. It was an urgent desire for betterment which probably explained his distinction, yet only rarely could one obtain a glimpse of his motives. In his thirtieth year he delivered a lecture at Moorfields in which, after speaking of the pleasures of the earnest pursuit of knowledge, he referred to cases of blindness caused by inflammation of the cornea, and used these words: "These cases occur amongst the poor, a class to whom the eye is, if possible, even more valuable than to the rich, because without it they can hardly obtain their daily bread or enjoy the common comforts of existence." Later, in a lecture to students, he spoke of a strong yearning for the advancement of knowledge, and said his whole soul was overflowing with a sincere desire to know and to practise whatever was right. He shared fully that humanitarianism which animated so many great Victorians. The master and inspirer of Bowman, said Sir Arthur, was Prof. Robert Bentley Todd, his senior by only seven years, and Bowman shared with Todd the chair of anatomy and physiology, and was never tired of extolling his colleague's merits which seemed indeed to be of a high order. His paper, published in THE LANCET (1842, i., 560), on the appearances revealed by the microscope in a case of fatty degeneration of the liver must have been one of the earliest

—if not the first—in which the microscope was employed to elucidate finer pathological changes. Bowman himself was quite aware he was opening up a new field, and claimed that the condition he had drawn attention to "was an admirable example of the kind and degree of insight into pathological changes which the microscope was calculated to afford." In the course of carrying out his microscopic survey of the glandular system of the body Bowman came to the kidney in or before 1841. He, in 1842, gave us at a single step our modern conception of the organisation of renal structures. For his paper on the structure of muscle he was elected Fellow of the Royal Society at the age of 25 (1841), and for his paper on the structure of the kidney he was given a Royal Medal. Bowman's account of the eye was the modern one—the eye as revealed by sections viewed through a compound microscope. Our conception of the cornea remained much as he left it; the ciliary muscle had no certain existence until he defined its relations, nature, and function, though he supposed that it served accommodation by altering the position, not the form, of the lens. He detected the circular and radial musculature of the iris, though it was left for later workers to amend his conception of the structural elements of that musculature. He saw the optic fibres circle on each side of the "yellow spot" yet dismissed the "spot" as of little importance in vision because it was not present in the eye of the dog, cat, rabbit, and bird—animals with perfect sight. He refused to regard the rods and cones (bulbs) as concerned in perception because they lay on the outer or "wrong" side of the retina. With a flash of insight he speaks of the eye as "a sheet of nervous matter brought towards the surface of the body to meet the appropriate stimulus," and then, in another passage, stated that the relationship between the retina and the "sensorium" was a problem "too inscrutable for our limited powers." Sir Arthur thought it could be said with truth that Bowman made a larger contribution to our knowledge of the anatomy of the eye than any other investigator. He certainly made mistakes, but when allowance was made for the primitive methods then at the disposal of microscopists, and the novelty and vastness of the field in which he laboured, the marvel was that he was so often right.

Sir Arthur touched on what he termed an enigma in Sir William Bowman's life. From his twenty-second to his twenty-sixth year investigations and discoveries followed each other regularly, and then his ardour for discovery, judged by results, seemed to have cooled, though he still added to the resources of medicine and surgery. Still, the last fifty years did not fulfil the promise of his earlier ones. An event of significance at this time was that in 1842 he was happily married, and the lecturer speculated on what might have happened had Bowman, in the full tide of his discoveries, been appointed surgeon to King's College Hospital in place of Sir William Fergusson. He concluded his lecture by drawing attention to the resemblances between Lister and Bowman. Both those great men proved in their first publications that they were not apprentices, but master workmen; both became Fellows of the Royal Society; they had much in common physically and their tastes harmonised; and both had a deeply rooted desire to help the poor and unfortunate. They were equally modest and unassuming. If in the turn which fate gave to Bowman's career general surgery could be said to have suffered, ophthalmic surgery certainly reaped rich reward.

Prof. VAN DER HOEVE read a paper on the

Eye and Amnion Bands.

He said these bands exercised a great influence on the development of the human being and they could cause great damage; they certainly were responsible for facial and other disfigurements, and might even cause amputation of limbs. In some cases such a band extended from the eye to the mouth, distorting both. He projected some pictures of patients so affected and showed that much could be done to improve the appearance in some victims.

Mr. AFFLECK GREEVES read a paper on

X Ray Applications in Superficial Keratitis.

He showed that in cases of acne rosacea, a very painful condition with ulcers of the cornea and scarring, X rays produced a lessening of the pain and the photophobia. Often a single application of the rays brought great relief. The same measure gave good results in recurrent abrasions of the cornea, causing immediate and rapid healing. He was unable to record successes by this means in cases of Mooren's ulcer, though some of these patients reported diminution of pain. Neither did the rays cause marked improvement in bullous keratitis.

Mr. J. W. TUDOR THOMAS gave the results to date of a long investigation into the possibilities of

Transplantation of the Cornea.

He brought for exhibition four rabbits in which he had succeeded in producing clear corneal grafts. He said that transplantation of corneal tissue was first attempted 107 years ago, since which date many attempts had been made, but, so far, no really satisfactory operative procedure had been established. The sixth of a series of methods tried had provided good results. This consisted of the taking from the margin of the cornea of a graft of triangular or quadrilateral shape and uniting it to the cornea by cross-stitches, a wide iridectomy being performed so as to prevent the iris from adhering to the graft. Fourteen rabbits were operated upon in this way. In 13 of them the grafts became united. Two were quite transparent at three and four months respectively. Even better results were obtained when the grafts were circular. The various stages of the research were clearly shown by photographs of the rabbits exhibited on the screen. Mr. Tudor Thomas said that the grafts must be manipulated with great care and must not be grasped by forceps or other instruments. Olive oil should be used to lubricate any instrument which might come in contact with the graft, and the latter should be placed in sterile olive oil before placing it in the gap prepared for its reception. The margins of the graft should be cut in a shelving manner; it should be round, so that there were no corners to become detached and protrude. Partial detachment produced opacity, which usually affected the whole graft, as also did adhesion between the iris and the graft. Cross-stitching seemed to overcome most of the difficulties. He proposed to continue this work as it was far from complete. He intended to defer trying the method on a human patient until he had obtained more exact information from his experiments on rabbits.

In connexion with the Congress a reception was held at the Royal College of Surgeons, and Miss Mann gave a demonstration of pythons' eyes seen by the slit-lamp and of the ophthalmoscopic examination of various varieties of lizards and frogs at the gardens of the Zoological Society.

THE BANQUET.

The Jubilee Banquet was held on April 4th at the Hall of the Fishmongers' Company, with the President (Mr. LESLIE PATON) in the chair. Among the foreign guests present were:—Prof. Fritz Ask, Dr. Bailliart, Dr. Henri Coppez, Prof. Emile de Grósz, Dr. A. W. Mulock Houwer, Prof. J. van der Hoeve, Prof. Josef Meller, Dr. V. Morax, Dr. M. Marquez, Dr. E. Marx, Dr. René Onfray, Prof. Giuseppe Ovio, Dr. E. Pflüger, Prof. F. Terrien.

The President, in proposing the toast of the Society, said that of the 114 original members who held their first meeting in June, 1880, 11 survived. Two (Sir Thomas Barlow and Mr. J. B. Lawford) were present. Sir George Berry had been prevented from attending by urgent political business. Among the first vice-presidents had been George Critchett and that great clinical observer, Jonathan Hutchinson.

Mr. Paton advised any young man who thought he had discovered a new clinical fact to make perfectly sure that Jonathan Hutchinson had not already described it. He felt that we were on the verge of great advances in our knowledge of the structure of the body; that we were indeed standing on the boundary of a new and undiscovered country, some of the prominent features of which were beginning to show up through the mists of morning.

Sir THOMAS BARLOW, responding to the toast, described the origin of the society from a group of young men who had met in the house surgeon's room at Moorfields to discuss subjects which interested them. The first secretary, Edward Nettleship, had been clinical assistant to Jonathan Hutchinson. Nettleship had gathered up the experience of Moorfields and its great traditions; he had had the most comprehensive knowledge of the pathology of the eye. Another early member was Warren Tay, a modest man who had never achieved the reputation he deserved. Other original members were Stephen McKenzie, Brailey of Guy's Hospital, Morton, George Berry, and Marcus Gunn. Two great men not among the original members had had an abiding influence on the society—Jonathan Hutchinson and Hughlings Jackson. After the club had met for a year it had seemed time to enlarge its scope, and a circular letter had been sent round. Seniors who were not members had given generous support, among them William Bowman and William Gowers. The club and society had made a common meeting ground for surgeons, physicians, and pathologists, and that common ground had been one of the causes of its success. The history of the Ophthalmological Society was a lesson to the whole profession on the spirit in which specialties should be considered.

The health of the Bowman lecturer was proposed by Sir JOHN PARSONS. Sir Arthur Keith, he said, had two methods of attack when he found himself confronted with a new specimen of *Homo sapiens*. His synthetic method had made him the champion jigsaw puzzler of the world, and he had recently got into trouble with the theologians because he had been unable by his analytic method to find the soul. Descriptive anatomy was the valley of dry bones spoken of by Ezekiel, the prophet, but the prophet had had a vision, and Sir Arthur Keith must have imbibed that spirit, for no other anatomist was so good at making dead bones live.

Sir ARTHUR KEITH, in reply, said that the society had given him that afternoon the finest of all subjects on which to speak—a great man whose greatness had not been fully realised. The history of William Bowman had much to do with the success of the Ophthalmological Society. England was the recognised home of three great schools—the physiological, the neurological, and the ophthalmological—and between the last two there was something akin. Ophthalmology was not narrow; it dealt with the whole body. Men working at the retina were working at the brain, and it was possible to obtain more intimate insight into the great systems of the human body through the eye than through any other part.

The toast of "The Guests" was proposed by Mr. J. H. FISHER.

Prof. VAN DER HOEVE, in reply, conveyed greetings and thanks from the foreign guests, and on their behalf presented to the chairman an ivory presidential hammer. Bowman would, he felt, have approved of this gathering, for he had been one of the most international of scientists, visiting foreign centres and entertaining foreign scientists at his home. The society had kept to the high standard of scientific endeavour bequeathed to it by its first president.

Sir JOHN BLAND-SUTTON, who also replied, said that he had attended the second meeting of the society in December, 1880, at the invitation of Mr. Critchett, a man who had so impressed him as a student that he had nearly become an ophthalmic surgeon. Critchett had been ambidextrous, and would take out the lens of the right eye with the right hand and the lens of the left eye with the left hand at a single operation, and while he manipulated the cornea he had held his cataract knife in his mouth. In those days most ophthalmological work had been done by general surgeons, but the invention of the ophthalmoscope had changed all that. The ophthalmoscope was the prince of clinical instruments and ophthalmology the most justifiable of specialties.

Mr. TREACHER COLLINS proposed the health of the Chairman and Mr. LESLIE PATON briefly replied.

THE DISTRIBUTION OF LEAD INSIDE AND OUTSIDE THE BODY.

QUANTITATIVE INVESTIGATIONS INTO THE PRESENCE OF LEAD IN VARIOUS SUBSTANCES, AND ON ITS ABSORPTION AND EXCRETION.

IN the course of experimental work conducted by the Departmental Committee on Ethyl Petrol certain investigations were made, the results of which are of general interest independently of the purpose for which they were organised. They are concerned with the presence of lead in the urine, in dust of streets or garages, the amount of lead retained by the lungs, and so forth, and were performed under the direction of Mr. A. G. Francis, F.I.C.

Lead in urine.—Minute quantities of lead were found to be present in the urine of almost every subject examined (average 0·040 mg. per litre). Persons living in towns excrete more than persons living in rural districts, and persons exposed to a definite lead hazard excrete comparatively much larger quantities. These findings are in conformity with the observations of the United States investigators. The detection and measurement of minute quantities of lead in urine have been made possible by the greater refinement in analytical methods which has been achieved in recent years.

Lead in the settled dust of the streets.—This investigation was undertaken to ascertain to what extent the general population is liable to take in small daily amounts of lead. The results of the experiments show that the settled dust almost everywhere contains small quantities of lead (from nil to 3·3 per cent.). It is calculated that dwellers in London inhale, on the average, nearly one-tenth of a milligramme of lead in a day. It is therefore not surprising to find that lead is absorbed into the system as shown by its presence in the urine of normal persons.

Lead in the settled dust of garages.—In London small quantities of lead are found similar to those found in the settled dust of the streets, but far less than those in the dust of factories where lead is used.

Lead in lubricating oil.—Oil from the crank case of cars that have not used ethyl petrol contains no volatile lead, and only traces of non-volatile lead, the maximum proportion of non-volatile lead found being only 0·01 per cent., and this non-volatile lead is present in the "carbon," that is, it is insoluble in the oil itself.

A very slight quantity of lead was found in samples of lubricating oils from cars run on ethyl petrol, but it was calculated that the proportion of volatile lead remaining on the hands of a mechanic at any given time would not be likely to exceed 0·6 mg.

Proportion of lead retained in the lungs.—The conclusions reached were that (1) Dilution of exhaust gas containing lead compounds with air is rapid. (2) The likelihood of users of the streets inhaling a dangerous quantity of lead when "puffs" of lead compounds are blown out from the exhaust pipes of motor vehicles during the acceleration of their engines is remote. (3) The daily dose of lead likely to be retained in the lungs of vehicular drivers and

other users of the streets under traffic conditions more severe than obtain in the streets at the present time is far below the quantity stated by Legge to be the minimum quantity of lead which, inhaled as dust or fume, may in the course of years set up chronic plumbism.

The Absorption and Excretion of Lead by Normal Rabbits in Captivity.

Certain control experiments carried out by Prof. W. E. DIXON, F.R.S., on the absorption of lead yielded interesting results. Five rabbits were clipped for a space of about two inches square on either side of the back adjoining the spine. In five others the same area of hair was removed by a depilatory.

Two liquids were used for application to the skin. One of these was prepared from ordinary petrol. The petrol was redistilled, the last 5 per cent. left in the still being kept for use. The second liquid was used for purposes of comparison and consisted of petroleum ether which had been redistilled.

Five rabbits each received 15 drops of redistilled petrol on the shaved parts daily. The other five rabbits were treated in the same way except that petroleum ether was used. Each rabbit received in all 18·4 c.cm. applied to the skin.

The animals of this series received no lead except by contamination of the food or through dust, and neither of the volatile liquids which were applied daily contained lead. During the two months which the experiment occupied, samples of urine from each group were sent on three occasions for analysis in lead-free bottles and at the conclusion of the experiment, when the animals were killed, samples of the liver, brain, and kidney were also sent to the Committee's Laboratory.

The treatment had no effect on health or appetite, but one remarkable feature in the experiments was the fact that the urine from the petroleum ether rabbits was about three times as great as that from the petrol rabbits. This feature became less marked after the first few weeks, though later it again became pronounced. The exact figures of four typical rabbits were as follows:—

In the first 14 days two rabbits treated with redistilled petroleum ether passed on an average 210 c.cm. of urine a day. Two similar rabbits treated with the last 5 per cent. petrol passed on an average 55 c.cm. of urine per day; that is, in 14 days these last rabbits passed 1426 c.cm. of urine, whilst the petroleum ether rabbits passed 5450 c.cm. of urine. During the next seven days, whilst the petrol rabbits passed 2250 c.cm. of urine the petroleum ether rabbits passed 2620 c.cm. of urine. After a break of three weeks, during a period of ten days, the petrol rabbits only passed 1000 c.cm. of urine, whilst the petroleum ether rabbits passed 2240 c.cm. of urine.

The observations showed that normal animals in captivity absorb and excrete traces of lead. The lead is taken by the mouth with food or is absorbed as dust from the nasal mucous membrane. Most of that taken by the mouth we know is converted into the insoluble sulphide and passed out by the fæces unchanged. A very small amount of this is absorbed and a variable percentage, which is believed to be constant, is excreted by the urine, the rest being again excreted by the bowel. Some lead is retained, mainly in the bones, liver, and kidney. In acute poisoning as much as 95 per cent. of the retained lead has been found in the bones, but in chronic poisoning the bones contain very little.

In the normal control rabbits only about 3·7 mg. of lead was excreted by four rabbits in 54 days. No great difference occurred between the excretion in the two groups, though the larger amount of urine excreted in the petroleum ether rabbits carried with it a trace more lead. The livers, brain, and kidneys of these control animals also showed no appreciable amount of lead.

Experiments using ethyl petrol applications showed that the excretion of the lead under these conditions is mainly by the bowels and, further, that in the amounts used the rate of excretion kept pace, or nearly so, with the rate of absorption. The experiments proved that the daily application to the skin of rabbits of 0·27 c.cm. of 2 per cent. lead ethyl dissolved in distilled petrol is without ill-effect of any kind up to 130 days, in spite of the fact that the skin was specially prepared to facilitate absorption. To obtain a comparable experiment with ethyl petrol, on the assumption that ethyl petrol contains 1 in 1300 by volume of lead tetra-ethyl, 7 c.cm. would be required daily.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

The San Francisco Cancer Sensation.

Dr. Walter B. Coffey and Dr. John D. Humber, of San Francisco, observed that the injection of an extract of the suprarenal cortex of the sheep causes softening and liquefaction of carcinomatous tissue. The observation came as the result of treatment of patients with hypertension who happened to have carcinoma as well. When these experimental observations were announced to the Pacific Coast Surgical Association, reporters of the Hearst press obtained word of them and whole pages were devoted to the great discovery and to the generous instincts of the press for the benefit of humanity as contrasted with the conservative reticence of the medical profession. Telegrams and letters began to pour in to the offices of every physician and association that might be suspected of esoteric knowledge of the "cure." The doctors were summoned to give evidence before a committee of the Senate in Washington what time cancer sufferers began to trek across the continent in the opposite direction. To calm the excited multitude it has been necessary to appoint a strong committee of investigation including Surgeon-General Cummings, Dr. Charles Mayo, Dr. Morris Fishbein, Dr. Francis Carter Wood, Dr. Joseph Colt Bloodgood, and others. The expenses of this committee are to be borne by the Chemical Foundation.

Osteopath as Health Officer.

A year ago the city council of Ellensburg in the State of Washington appointed an osteopath as city health officer. Acting under advice from the State Board of Health the incumbent physician refused to vacate office on the ground that the new appointee was not a "legally qualified physician." This conclusion of the State Board of Health was sustained by the first court but their judgment has now been reversed by the supreme court of Washington. The supreme court holds that the term physician has of late years been broadened to include the osteopath. The possibility of a health officer refusing to carry out the regulations of the Board of Health in regard to vaccination and the administration of antitoxin is one that the court does not seem to have had under consideration. An effort will be made to have the whole question reviewed. In the meantime the idea is slowly but steadily gaining ground that it is well to appoint to public health positions men who have diplomas in public health.

Secret Remedies on the Air.

The advertising of secret remedies in the more respectable journals is becoming less common. Proprietors of such wares have, however, discovered a profitable field of advertisement in the broadcasting stations with which this country is richly endowed. The first definite steps to correct this abuse have been taken recently in New York City, where the Public Health Commissioner, Dr. Shirley W. Wynne, has held three public hearings on the subject. Some 40 radio broadcasters decided that Dr. Wynne should select a committee of public

health officials and devise a plan by which broadcasters might receive explicit information quickly in programmes of a medical nature. Another committee of business associations is to report amendments to the code of ethics of the National Association of Broadcasters. Opposition takes the standpoint that any remedy or device which is not illegal has a right to advertisement; the larger broadcasting companies, however, agree that no remedy should be so advertised if it rests under any kind of suspicion. The Welfare Committee of the New Jersey State Medical Association has also taken some steps in opposition to radio quackery. The secretary of the Board of Medical Examiners has been kept informed of radio speeches that amounted to the practice of medicine and one man has already been convicted on a charge of practising medicine without a licence.

First-aid in Industry.

A method of organising first-aid and accident prevention work in industry has been worked out by Dr. D. L. Lynch, medical director of the New England Telephone and Telegraph Company. At first he attempted to spread a knowledge of first-aid by medical instructors, but he has found it more successful to train picked representatives from among the employees and to let them train their fellow workmen. These lay instructors are selected for qualities of leadership and once they have grasped the principles themselves are especially efficient in explaining them to other workers who in their turn are more willing to ask questions from a fellow employee. These trained men help to popularise modern methods of accident prevention and to bring for early treatment many cases that would suffer neglect but for a confidential intermediary. Many of the medical societies throughout the country are now reconsidering the official attitude of condemnation towards medical men employed by "contract" with industrial concerns. If one may judge from editorial expression in some of the State medical journals the profession is about ready to endorse this form of medical practice.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Road Accidents and Voluntary Hospitals.

THE burden put upon the voluntary hospitals by road accidents is steadily increasing here as in England. At the recent annual meeting of the Monkstown Hospital the chairman, Dr. W. M. Wright, stated that 90 cases of motor accidents had been treated in the hospital during the year, costing double the amount expended in respect of all other accidents. Many of those injured are well-to-do people, who make little or no contribution to the hospital funds. And, again, for a high proportion of the road accidents someone is made amenable at law, and therefore liable for damages. In the great majority of such cases the hospital gets nothing. The board of Monkstown Hospital passed a resolution asking that a law should be passed to render insurance against third party risks compulsory on all motor-drivers, and making the cost to voluntary hospitals in case of motor accidents a first charge on the insurance money.

The Royal Victoria Hospital, Belfast.

The senior surgeon to this hospital, Mr. A. B. Mitchell, has retired from active duties in the wards to the great regret of his colleagues. He has been elected consulting surgeon, and his administrative abilities will be retained in its service in his capacity of vice-chairman of the board of management. He is succeeded in the wards by Mr. P. T. Crymble, surgeon to out-patients. Mr. G. R. B. Purce has been elected assistant surgeon.

The late Dr. Charles Dundee.

Dr. Charles Dundee, who died unexpectedly at Ballycarry on April 3rd after a brief illness, belonged to a medical family well known in County Antrim. He was the son of Dr. C. Dundee, of Ballycarry, the brother of Dr. W. B. H. Dundee, of Ballynure. He was educated at the Royal Academical Institution, Belfast, and Edinburgh University, where he qualified in 1913, taking the D.P.H. a year later. During the war he served with the Ulster division, and was gravely wounded, losing his left arm. He received the Military Cross for great gallantry under fire. After demobilisation Dr. Dundee was appointed assistant tuberculosis officer for Co. Antrim. He had a charming manner, and was as popular among practitioners as he was in the public health service. Moreover, he took an active interest in the farming community amid which he lived.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

A Fatal Accident with Diathermy Apparatus.

A FEW weeks ago public attention was aroused by an accident which caused the death of a well-known physician specialising in electrotherapy. The physician was seen by a servant when he was standing in front of the apparatus, the lid of which was open, with both his hands inside the machine making some adjustment. Suddenly she saw a bunch of sparks darting from the apparatus, heard a scream, and saw her master fall to the floor. She ran to him and screamed for help, but some time elapsed before anyone came to the scene of the accident. Even when medical help was procured, it was first thought that the physician, who had suffered from heart trouble, had had an attack of angina pectoris; thus valuable time was lost before artificial respiration was instituted. When the real cause of the accident became evident it was too late. Subsequent investigation showed that the physician had been the victim of his own insufficient precautions. He had a pair of indiarubber shoes on his feet and indiarubber gloves on his hands, but these latter were not in perfect condition. He had evidently switched on the current whilst working on the apparatus, in the attempt to find the origin of a fault in the machine, believing that he had insulated himself. This accident has caused alarm among patients who are unwilling to undergo medical diathermic treatment, though it has been publicly stated that diathermy is absolutely free from danger to the patient. The unfortunate physician met his death only because he unscrewed the lid of the machine and meddled with the fittings without turning off the current of 220 volts which passed through his body. This is the first instance on record of death caused through the medical diathermy set.

Treatment of Detachment of the Retina by Ignipuncture (Gonin's Method).

At a recent meeting of the Vienna Medical Society Prof. Lindner demonstrated nine patients on whom he had successfully performed the so-called Gonin's method of operation for detachment of retina. The method consists in cauterising the torn edge by means of an electric cautery. Prof. Gonin uses the cautery for four seconds, whilst Prof. Lindner leaves it in *situ* for from 8–15 seconds. Dr. Guist, Prof. Lindner's first assistant, has constructed an apparatus which works like a perimeter, with which he is able to locate the exact point to be cauterised. Hitherto the difficulty of locating this spot has been a great disadvantage of the method, so that Guist's appliance is a distinct and important advance. Prof. Lindner claimed that in detachment of less than four weeks'

standing over 50 per cent. of permanent cures could be obtained by the galvanocautery. Older cases of detachment, however, rarely gave very satisfactory results. This "new" method, although now practised by its author for several years, has not many adherents outside of Switzerland, where Gonin works, and Lindner's clinic is probably the only place in Austria where this operation is being systematically tried out.

Legal Protection of the Title "Dentist."

The Board of Education has recently issued two orders which are the result of protracted negotiations between the dental section of the Wirtschaftliche Organisation (Union of Practitioners) of Austria and the Government, concerning the right of a medical man to style himself "dentist." This is the first instance in this country of legal protection of the title of a specialist in any one branch of medicine, and it is expected that it will soon be followed by a general declaration of what training a specialist must have in order to claim this title. According to the new regulations a dentist must first of all pass all the examinations necessary for qualification as a doctor in this country; then he must work for at least two years at a dental clinic, and, moreover, pass an examination showing his proficiency in anatomy, pathology, and surgery of the teeth, and mechanical dentistry. Furthermore, he must practise in dental work exclusively, and may not combine it with any other branch of medicine. Of course, any medical man is entitled to do dental work as a part of his other medical work, but he is not to call himself dentist, but remains a general practitioner.

Detection of Diseased Arteries by Uroselectan.

At the last meeting of the Gesellschaft der Aerzte Dr. Sgalitzer, from Prof. Eiselsberg's clinic, together with Dr. Kollert, showed a new method for the examination of arteries by means of X rays. The artery is laid bare under local anæsthesia, and 10–15 c.cm. of uroselectan—an organic compound of iodine, in which the iodine is firmly attached to the organic molecule, is injected into the artery with a fine needle. There is no danger of iodism, as has been amply demonstrated by using this drug in pyelography, and no free iodine appears in the urine. As the injection into the artery is sometimes painful, it is desirable to give a few whiffs of ethyl chloride to induce light general anæsthesia. If the arteries are believed to be diseased, the strictest aseptic conditions must be observed. The injection is in the first place done for diagnostic purposes; hitherto ten patients have been so treated. In some cases (one a case beginning gangrene of the big toe) a remarkable improvement has been the unexpected result. The authors, who have been assisted by a surgeon, Dr. Demel, have hitherto tried this method only on the arteries of the extremities, and have demonstrated the presence of emboli, thrombi, endarteritic, and arterio-sclerotic changes or spastic conditions. By combining the uroselectan injection with vaso-dilating substances, it is possible to differentiate spastic from organic stenosis of the vessels. If deposits of lime are visible in the arterial wall, before injection, the evidence is in favour of organic disease. If spastic conditions are found, treatment with yohimbin (1–5 mg. per day) is said to give good results, especially in ischæmic conditions like nicotine-intoxication or syphilitic endarteritis. Investigations of the capillaries under the finger-nail margin after uroselectan injections gave very interesting results. They show that these injections distinctly influence the circulation in the capillary system in the direction of increased pressure and flow of the blood stream. The indications for the new method are as yet not established. But in aneurysm of the peripheral arteries and in various pathological conditions of the venous system it should give useful results. So far it has served to localise exactly the site of an embolus, and the site of election for amputation in cases of peripheral occlusion of an artery.

CONFERENCE ON BIRTH CONTROL.

THE GIVING OF INFORMATION BY PUBLIC HEALTH AUTHORITIES.

A CONFERENCE organised by the National Union of Societies for Equal Citizenship, the Society for the Provision of Birth Control Clinics, the Women's National Liberal Federation, and the Workers' Birth Control Group, to discuss the giving of information on birth control by public health authorities, was held at the Central Hall, Westminster, on April 4th.

Birth Control and the Population Problem.

Dr. KILLICK MILLARD (M.O.H., Leicester), who presided at the morning session, said he was impressed by the profound change in the public attitude to this question in the last few years. The principal object of this conference was to emphasise the demand to the Ministry of Health to remove the embargo against the giving of information on birth control at municipal antenatal clinics. If birth control was to be justified as a national policy it must be based on something broader than individual hardship—that is, on the assurance that there were sound national and international grounds for believing that unlimited increase of population was not desirable.

Mr. HAROLD WRIGHT gave an able exposition of the Malthusian doctrine, and explained that the demand for increasing population might be met either by a falling death-rate or a rising birth-rate, but there was all the difference in the world between the two in terms of human well-being and happiness. Mr. Wright regarded birth control as an unmixed good, both from the point of view of the individual and of the race as a whole.

Birth Control and Maternal Health.

The CHAIRMAN referred to a statement made by Dr. Vernon Davies in the House of Commons recently, that competent gynæcological and obstetric surgeons were opposed to birth control, and quoted figures of answers received by him to a questionaire on this subject to prove that the opposite was the case.

Mr. HAROLD CHAPPLE, F.R.C.S., based his arguments on three fundamental questions: (1) Were there any medical grounds on which married people needed information about birth control? (2) Had they a right to it? (3) Were the public health authorities the people who should supply it? He believed the answer to all three questions to be in the affirmative. The out-patient department of any hospital would supply ample evidence on the first point. A woman with several children, suffering from an uncompensated heart and again becoming pregnant, a tuberculous patient, or a woman with kidney disease, furnished three gross and obvious examples of cases which existed in thousands. People who objected to birth control asked why it should not be possible to exert such self-control that these catastrophes never occurred. Mr. Chapple thought that people who put that forward as a serious suggestion must have either a very limited or a very fortunate experience. For those obliged to share a bed it would impose a physical strain too great to be borne. In some persons the sex urge was comparatively slight, in others an almost overwhelming force. Much clinical experience led him to the conclusion that there was no such time as a "safe" period. The underlying principle of birth control was in line with the medical view of prophylaxis. Modern devices might occasionally produce a little local soreness, but Mr. Chapple had never seen a case in which real harm had been done. These methods were available to the well-to-do, why should they be withheld from people whose one source of information was that of clinics? This kind of teaching could not be given in the out-patient departments of hospitals. Knowledge need not be thrust on people who did not want it, those who did want it had a right to it. He urged local authorities to help

in bringing about what he believed would be a great blessing.

Dr. HELENA WRIGHT spoke from her personal experience at a birth control clinic on the effects of sound birth control knowledge and practice on maternal health. There were good and bad methods of birth control, and a good method must be reliable, harmless to the health of mother, father, and children, easy to learn and apply, and cheap. The question was not one touching the poor alone; there came a time in every family when the mother decided that she had enough children. If she was denied a knowledge of birth control four alternatives were open to her: (1) she could continue to live in her present state of anxiety, resulting in strained relationships between her and her husband and children; (2) the father and mother could decide to live henceforward merely as friends, but this would also submit the partners to an unreasonable and unnatural strain; (3) the couple could devise home-made methods of birth control, as was frequently done. The commonest procedure was what women described as "being careful," which was quite unreliable and a complete denial of the physical side of married life; (4) the fourth alternative was the sinister business of abortion. If an ideal method of birth control could be discovered there ought never to be another deliberately induced abortion. Another result, though an indirect one, would be that in properly conducted hospitals where knowledge could be obtained women might come for regular examination, with the result that all diseases of the pelvis could be prevented or attacked at an early stage.

Miss STELLA BROWN put in a plea, in which she was supported by the Hon. Mrs. BERTRAND RUSSELL, that abortion, properly conducted in hospital in the early stages of pregnancy, should be legalised in this country as it had been in Norway.

Dr. HALLIDAY SUTHERLAND drew attention to the fact that nobody had suggested reducing the size of families by the improvement of living conditions; the whole thing depended on environment. The effect of birth control on maternal mortality should not be overlooked: Bermondsey, with a high birth-rate, had a maternal mortality-rate of 2 per 1000, whereas Westminster, with a low birth-rate, had a maternal mortality-rate of 12 per 1000. Danger to the mother was greatest in the first confinement, the risk becoming progressively less until after the fourth, and the lowest death-rate was among the youngest group of mothers. Undue delay of the first confinement and too prolonged spacing of the family increased the risk of death in childbirth.

Dr. F. A. BELAM (M.O.H., Guildford) said there was much confusion of thought and ignorance about the difference between birth control and abortion, and it was of great importance that information should be properly given and not picked up haphazard.

Mrs. EVA HUBBACK, who took the chair at the afternoon session of the conference, said that discussion of the attitude of the public health authorities was peculiarly opportune at the present time, since under the new Local Government Act the local authorities would have more power to undertake any work they chose. Under the Maternity and Child Welfare Act it was the duty of the public health authorities to give advice to pregnant mothers, and advice on birth control should be an extension of this power. The session would be confined to a discussion of methods of conveying the necessary information to married women.

Dr. MAITLAND RADFORD (Shoreditch) said that public health measures were continually defeated by ignorance in the homes. It was impossible for a poor mother of 10 or 15 to preserve a suitable environment for growing children, or even to provide accommodation for them. Contraceptions were much more freely used in the middle than in the labouring classes. He recommended that advice on birth control should be given (1) to those in whom the physical condition was such as to make pregnancy a danger to life; (2) to tuberculous and syphilitic women, at special centres to which all women requiring this advice should be referred. Men attending tuberculosis and venereal centres should also receive instruction in contraception; (3) to women with limited incomes, and growing families, to prevent overcrowding. Birth control centres should be under the charge of medical women supported by trained nursing staffs. The information should not be combined with advice at infant welfare or antenatal clinics, since these subjects were wide enough in themselves. The public health authorities should coöperate with existing voluntary centres, and later establish centres of their own. At Shoreditch a women's hospital was to be opened at which this advice would be given in addition to medical and surgical treatment of disease.

Mrs. POWELL (Reigate) described the origin of a birth control clinic in connexion with the maternity and child welfare work in her area. The town council had raised no objections to the scheme.

Mrs. D. THURTLE thought the chairman unduly optimistic about the powers of the local authorities under the new Act, but said that it was important to involve them in the work as much as possible, so that the movement would have become a powerful one should the Ministry of Health intervene later. As to methods, country districts might be supplied by travelling clinics; welfare centres and sunlight clinics might permit the use of their buildings on vacant days. Mothers would be more ready to attend a familiar place where the personnel was known to them.

Mrs. H. J. LASKI said that in 1925 the Ministry of Health had issued a circular to maternity and child welfare centres saying that women who appeared to require advice on contraception on medical grounds should be referred to a private practitioner, to a hospital, or to a birth control clinic. In practice it was found that these patients were not cordially received at hospitals, that the clinics were too few, and that the medical practitioners recommended by the Ministry could ill spare the time to give detailed advice to women who, moreover, could seldom afford a fee. The expense of starting centres in the buildings at welfare clinics should not be great. Birth control should, of course, be taught on days other than those devoted to welfare work. Proposals for new centres should certainly be put before local authorities, but the work was urgent, and should be undertaken at once, using existing means.

Mrs. SYDNEY FRANKENBURG thought that centres should be run in association with a welfare clinic or hospital. She gave practical details of a centre which was running satisfactorily. A small charge was made to the women.

Among other speakers Dr. NORMAN HAIRE said that though no fool-proof contraceptive had so far been available, constant experiment was leading to improvements. All methods required care and attention to be successful. The question of expense was subsequently discussed, and the possible increase in rates as a result of establishing centres was mentioned.

In replying, Dr. RADFORD said that spacing of children should be part of public health work for economic as well as hygienic reasons. A spread of opinion in favour of birth control would lead to its inclusion in the public health scheme.

Resolution.

In conclusion Mrs. HUBBACK moved the following resolution:—

"That this Conference calls upon the Minister of Health and Public Health Authorities to recognise the desirability of making available medical information on methods of birth control to married people who need it on medical grounds or who ask for it."

Dr. RADFORD proposed an amendment to the effect that the resolution should stop short at the words "who need it." This was carried, and the amended resolution passed.

Correspondence.

"Audi alteram partem."

ATHLETICS IN SCHOOLS.

To the Editor of THE LANCET.

SIR,—With deference to Dr. Cove-Smith it seems difficult to agree with some of his views on rowing. When rowing is properly taught the muscles of the trunk and limbs are brought into play with the work apportioned so as to avoid certain of these muscles becoming "overworked at the expense of others." The heaviest strain is put on the back and thighs, regions which are best provided to meet it. The hands and arms deal with the finish of the stroke, the feather and the clearing of the hands quickly over the knees before sliding forward for the next stroke. The last of these three phases is carried out by the action of the triceps, and, although it comes into action and development more than the biceps or other muscles of the upper arm, it scarcely can be said to be "overworked," or even "overworked at the expense of the other muscles."

Dr. Cove-Smith states "the return flow of blood from the lower half of the body is not adequately provided for." I must confess I am too dense to discover his meaning here. With feet on the stretcher they are merely a few inches below the level of the hips. In the swing back they are only a very little more than this below the level of the heart. A further assistance to emptying the veins is brought about in the constant muscular actions from abdomen to feet in the bendings at hips, knees, and ankles. Has anyone ever heard of varicose veins, or unduly dilated veins of the legs or abdomen occurring as a result of rowing? Varicose veins of the legs are occasionally seen, but the condition is neither due to rowing, nor affected by it.

One can agree with Dr. Cove-Smith when he says that provided the individual is of "sound constitution he will derive benefit from rowing, but otherwise he may do himself more harm than good." There is no great need, too, for uneasiness on this point. If the fact of being unsound has not been discovered before taking up rowing, it will very quickly be seen, once he attempts to learn. His coach will notice it and the beginner will be conscious of it himself before he meets with the amount of strain that would be injurious. Rowing is only for those that are sound. It does not seem necessary, though, to weigh the question of physique with as much importance as that of soundness. Rowing is a fine developer of physique and, provided a youth is organically sound, its fascination need not be confined to those who are the pick in this respect.

What is the "distinct medical problem at the present" in the middle-aged man, formerly a rowing man, that is referred to? Can it be a tendency to obesity? This does not seem to occur more frequently from rowing than from some of the other forms of athletics. It should be remembered, too, that rowing has a good percentage of what can be looked on as the hefty type. It was only on Saturday last in the head-of-river race over the Mortlake to Putney stretch of 4½ miles an eight in the first division was stroked by an oarsman of 60! And covered the distance in 20 minutes, in or about. An outstanding oarsman, it is granted. In the same race there was a crew in which none of the members were under 40! What is the "distinct medical problem" to be put down as? And with regard to what are referred to as "the faulty methods of training of the last century," these methods evidently did not injure the stroke of 60 years of age. The crew of "40 and over" would escape them as very likely each member would have been too young to be in training then.

Dr. Cove-Smith's views on Rugby football for boys are naturally valuable, and personally I give due weight to his opinion that the game should be under taboo before public school age.

I am, Sir, yours faithfully,

J. ARMSTRONG HARTLEY.

London, S.W., April 5th, 1930.

INTRAVENOUS INJECTION OF ETHYL ALCOHOL.

To the Editor of THE LANCET.

SIR,—In your issue of June 15th, 1929 (p. 1247), Dr. J. D. Constantin (Greenwich) described a method of general anæsthesia by the intravenous injection of ethyl alcohol advocated by Dr. M. G. Marin, of Mexico City. Dr. Constantin writes: "The use of ethyl alcohol intravenously had not, as far as I know, been reported until Dr. Marin's experiments became known. (Thesis presented to the National University of Mexico, 1929.)" I should like to call his attention to the fact that in 1927–28 I published in the *Zeitschrift für Krebsforschung* and in the Polish medical journal *Czasopismo Lekarskie* a method of cancer treatment consisting in intravenous infusion of 33·3 per cent. ethyl alcohol (in Ringer's or physiological salt solution). To this method I was brought by theoretical reasoning, and I was able by many animal experiments to prove that intravenous infusion of great quantities of ethyl alcohol, even in absolute form, can be given without danger

I am, Sir, yours faithfully,

Warsaw, March 28th, 1930. Dr. D. THURSZ.

IRRADIATED ERGOSTEROLS.

To the Editor of THE LANCET.

SIR,—Keen commercial competition combined with the modern craze for an all-vitamin factor in dietetics will soon flood the market with a series of proprietary food products of questionable quality, specially milk products guaranteed to contain a fair proportion of vitamin D. Experimental evidence is far from convincing, and remarkably divergent views are expressed regarding the general use as a therapeutic or prophylactic measure of a concentrated vitamin D factor in irradiated milk. The more one reads of vitamin D, the more is one convinced of the limited knowledge we still have of this accessory food substance. It will be many years before vitamin D problems can be recognised on established basis. It is premature, therefore, to employ a principle of doubtful utility to improve a standard natural product such as milk. To alter the properties of fresh milk by artificial light radiations or by the addition of a foreign product and to recommend this for general use is from all points of view against natural laws—the same laws which control vitamin active principles. For, have we not been told ever since Funk discovered "vitamine" that all similar unidentified factors or accessory food substances are most likely to be present in natural food? Moreover, if we are at all to accept Dr. K. Coward's recent alarming report that fresh milk, the only natural food for infants taken during all seasons, contains hardly any vitamin D, then the logic of irradiating milk to concentrate the same active principle for use as an antirachitic measure in infants is unsound.

Apart from these considerations, reports from reliable observers on the dangers of indiscriminate use of highly concentrated irradiated milk products cannot be over-estimated. Idiosyncrasy undoubtedly plays an important part and it is a well-known fact that a certain type of infant cannot tolerate cod-liver oil in any form. Specially during the summer months toxic and unpleasant symptoms of gastro-intestinal derangement are known to follow a minimum quantity even of ostelin. Every mother in the tropics knows that dermatitis, eczema, and boils result from the use of cod-liver oil. In two cases that came under my observation, the latent period of tolerance, so

common with a new product in cases of unsuccessful feeding of infants, was not observed with irradiated milk. Unlike the older products, irradiated food disagreed from the start and unpleasant symptoms developed immediately every time it was tried.

The manufacturers should arrange for a clean, fresh, and wholesome product, in quality as near as possible to the natural food. The addition of a therapeutic or prophylactic principle for special cases should be left in the hands of the medical attendant. To sell a concentrated prophylactic or therapeutic product for general use is against all principles of dietetics. Why has the vitamin D factor alone been advocated as a prophylactic measure? The calcium-phosphorus ratio as a determining factor in hypovitaminosis and rickets has been well recognised. If the public craze went as far as the calcium-phosphorus ratio, I daresay commercial houses would soon arrange to adjust the percentage of calcium and phosphorus to meet all requirements. And may I also ask why the sound principle of Fowler to inoculate milk with live tubercle bacilli as a prophylactic against tubercle has never been thought of?

I am, Sir, yours faithfully,

F. N. MOOS,

March 14th, 1930. Superintendent, G.T. Hospital, Bombay.

RELIEF OF BLINDNESS IN INDIA.

To the Editor of THE LANCET.

SIR,—I feel sure that it is contrary to your intention that the well-meaning leading article in THE LANCET of Dec. 21st should be liable to do an injustice, or create an incorrect impression of the actual facts concerning the relief of blindness in India or the teaching of ophthalmology. As it will appear to ophthalmologists resident in India that it may do so, may I be permitted to point out that some important facts bearing on your article may be found in an editorial in the *Indian Medical Gazette* for September, 1929, on Preventable Blindness in India, and in the report of Sir Norman Walker to the General Medical Council. Many of your readers may not have the opportunity of seeing the *Gazette*. You may therefore consider it desirable to represent some of the views therein expressed.

I am, Sir, yours faithfully,

ROBERT E. WRIGHT.

Government Ophthalmic Hospital, Madras.

ENLARGEMENT OF ADDENBROOKE'S HOSPITAL.—The Hon. Alexandrina Peckover has opened a second women's surgical ward of 27 beds. It has been named the Musgrave ward, in recognition of the services to the hospital of Mr. T. Musgrave Francis as chairman for several years of the general committee.

MEMORIAL TO HENRY HILL HICKMAN.—A tablet in memory of Henry Hill Hickman, for the erection of which part of the fund collected has been allocated (see THE LANCET, April 5th, p. 775), was unveiled at the Church of St. Mary the Virgin, Bromfield, Shropshire, on April 5th by Sir StClair Thomson. The tablet was dedicated by the Bishop of Hereford.

The ceremony took place in the presence of descendants of Dr. Hickman and the President and five Past-Presidents of the Section of Anæsthetics of the Royal Society of Medicine. Among those present were:—

Lord Plymouth, Lieut.-Colonel G. H. and Mrs. Windsor-Clive, Mr. W. Thomson Madin and Mr. C. H. Howkins (representing Birmingham University Dental School), Dr. J. R. Bulman, Mr. V. Warren Low (treasurer of the Hickman Memorial Fund), Dr. Cecil Hughes (hon. secretary), Mr. Raymond Apperley, Sir Francis Shipway, Dr. Z. Mennell, Mr. M. Ashley Daly, Mr. H. E. G. Boyle, and Dr. Ryan.

The inscription on the tablet is as follows:—

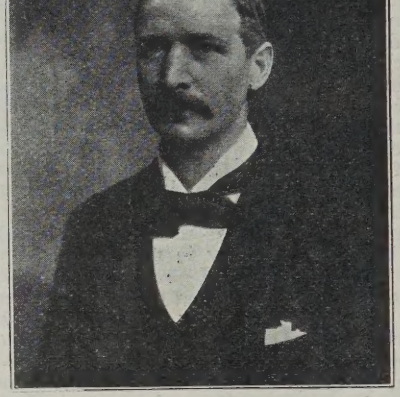
A.M.D.G.: Henry Hill Hickman, member of Royal College of Surgeons; born at Lady Halton in this parish January 27th, baptised in this church January 30th, 1800; died at Tenbury April 2nd, buried in this churchyard April 5th, 1830. This tablet is placed here at the initiative of the Section of Anæsthetics of the Royal Society of Medicine as a centenary tribute to the memory of the earliest known pioneer of anæsthesia by inhalation. Honour a physician with the honour due unto him. A.D. 1930.

Obituary.

JOHN YULE MACKAY, M.D. GLASG., LL.D.,

PRINCIPAL OF UNIVERSITY COLLEGE, DUNDEE.

Dr. Mackay, whose death at Broughty Ferry on March 30th was announced in our last issue, was in his 71st year. He resigned the chair of anatomy at the University of St. Andrews three years ago, but continued to hold the Principalship of University College until his death. John Yule Mackay was born at Inverkeithing, Fifeshire, where his father, the Rev. James Mackay, was minister, and studied at Glasgow University, where he graduated in medicine in 1882, taking his M.D. three years after. For 12 years he was demonstrator in anatomy at the University, and lecturer in embryology. In 1894 he was elected to the chair of anatomy at University College, Dundee, in succession to Prof. A. M. Paterson, who was transferred to Liverpool; and later when Paterson was appointed to the Vice-Chancellorship of McGill, Montreal, Mackay succeeded him as Principal of the Dundee College. It was at a time when feeling was running high on the question of union between the College and St. Andrews University, and Mackay played a large part in the delicate negotiations which made the college an integral part of the university in 1897. Quiet and unassuming in manner, Mackay was an effective worker. During his period of office University College rose from a school of nine faculties to one of 14 with two lectureships, and Dundee came to hold its own with its rivals. The staff and students of the college found in their Principal a personality of subtle charm and transparent sincerity, and came to regard him with warm affection.



DR. MACKAY.

The services rendered by Principal Mackay to medical education are not yet as widely recognised as they should be. It was in 1902 that he was elected to the General Medical Council to represent the University of St. Andrews, and within four years he became chairman of the Education Committee, holding that position until 1927. Those 20 years were critical for the education of the medical student, especially in preliminary scientific subjects, and almost every year, as the appendices to the Council's minutes testify, reports were drawn up and presented for which Mackay took a large share of responsibility. In 1907 appeared the interim report on the length of the curriculum and ages of students; in 1911 the report on preliminary general examinations; and in 1922 the final report on the revision of the curriculum was approved by the Council, Dr. Mackay being formally thanked from the chair for his services. As a result of these reports the curriculum was rearranged to ensure a period of three years at least between completion of anatomy and physiology and the qualifying examination, opportunities being offered in this period for the study of biology and physiology in their applications to medicine, surgery, and midwifery, and insistence being laid on the principle that throughout the whole period of study the student's

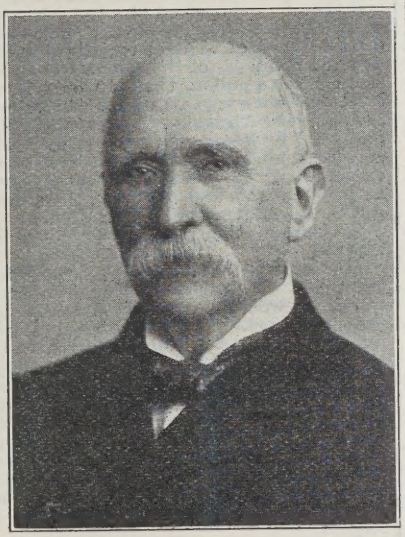
attention should be directed to the importance of the preventive aspects of medicine. All these things have now passed into the framework of the curriculum, and it was Mackay's devoted work as chairman of the Education Committee which made the transition possible.

In his own subject of anatomy he produced a number of books and papers. Along with the late Prof. Cleland, of Glasgow University, he brought out a text-book of human anatomy, general and descriptive, and his "Directory of Dissection" run through four editions. His earlier studies dealt chiefly with the comparative anatomy of the circulation.

Principal Mackay was unmarried.

SIR JOHN FAGAN, F.R.C.S.I.

Sir John Fagan died on St. Patrick's Day at his home in Portarlington, aged 86. He came of old Westmeath stock and was educated at the famous Castleknock School and at the Catholic University in Dublin, qualifying in 1865. He studied in London, Paris, and Vienna, and then returned to Ireland, settling in Belfast, where he was appointed surgeon to the Royal Hospital in 1872, becoming F.R.C.S.I. in 1874. He was especially interested in the surgical diseases of childhood, and, with the late Dr. Brice Smyth, founded the Belfast Hospital for Sick Children in 1873. Nearly sixty years later he was to see the foundation-stone of a greater Children's Hospital laid in ideal surroundings, and to know that it would take its place with the Royal Victoria and New Maternity Hospitals in a group of teaching hospitals. His services to the Children's Hospital are to be commemorated by a memorial in the new institution. Sir John Fagan was the last link of the Belfast Medical School with pre-Listerian surgery. He was the first surgeon in that school to adopt and practise Listerian principles. If he had practised in these latter times his bent would have been orthopædic surgery. Considering the incomplete pathological knowledge then available he showed a wonderful grasp of the principles of reparative surgery, and was among the earliest surgeons of his generation to substitute extensive resections of the so-called "scrofulous" joints for amputations. In this way he saved many valuable limbs.



SIR JOHN FAGAN.

Photo by Lafayette, Dublin.

Fagan was the first man in Belfast to confine his practice to surgery, breaking the tradition of combined general practice and surgical consultant work. With a younger colleague he opened a private hospital, and had much difficulty in convincing not only the public, but also the practitioners, that surgical operations could be performed with much greater safety in such surroundings than in private houses. He was twice elected to the Presidency of the Ulster Medical Society, was one of the few honorary Fellows of this society, an honour which he shared with Lister. The tone and reputation of surgery throughout the North of Ireland was raised by Fagan's work, to which he was apparently devoted, and it came then as a shock to his friends and to those accustomed to depend on his skill, when in 1897 he gave up his position as senior surgeon to the Royal Hospital and his extensive surgical practice in Ulster for the post of Inspector of Reformatory and Industrial Schools. This necessitated his return to Dublin. In his new work he was again a pioneer in attacking the methods of education and training then in vogue in reformatory schools. He risked grave unpopularity by instituting the methods which are still in force, and have received general praise. His success in these innovations was recognised by his appointment as medical member of the General Prison Board. Later he became a Deputy Lieutenant of the county, and was knighted in 1910.

Sir John Fagan had a fine presence and gracious manners. His relations with his colleagues and his patients were cordial. His clinical teaching was painstaking, clear, and decisive; and his old students—now a rapidly decreasing band—speak of him still with deep regard and affection.

Public Health Services.

MENTAL HOSPITAL REPORTS.

THE work of the *Royal Edinburgh Hospital* at *Morningside* now includes the care of certified patients at Craig House and the West House, and the prophylactic and early treatment of uncertified persons at the Jordanburn Nerve Hospital and a series of Associated Nursing Homes in and around Edinburgh. In the first two houses there were 847 patients on the register at the end of last year, and of these no less than 170 were on a voluntary basis. In the six nursing homes there were 62 patients, and 459 persons have passed through them in the last three years. Many of the patients come from England and Ireland to escape certification, and so great is the demand on the accommodation that four more homes are being equipped. Jordanburn has not yet been opened a year; it has 50 beds for patients of limited means, and more than half of them have been occupied most of the time it has been opened. An out-patient clinic is held every afternoon. Dr. G. M. Robertson discusses the abolition of certification in recoverable cases, and gives some interesting examples of stereotypy. The laboratory has been carrying out research on encephalitis lethargica and has found that the brain is much more extensively affected than is usually supposed, especially in the cortical area.

The *Glengall Hospital* at *Ayr* had 607 patients in residence at the end of last year, and of the 172 admissions seven were voluntary. More cases than ever are being sent in a precarious physical condition, and there is thus a high demand on the skill and devotion of the nursing staff. The recovery-rate was 36 per cent. and the death-rate 14·5 per cent. The illness had lasted for more than a year before admission in 88 per cent. of the fatal cases, and the medical superintendent points out the importance in mental cases of the adage "Save me from my relatives." The general health during the year was good, and there was no epidemic disease. A fuse in an electric wire caused a serious outbreak of fire, but all the patients were safely removed in five minutes—in ten minutes part of the roof fell in—and provided with other beds within a couple of hours. By 10 o'clock the next night the distribution of patients throughout the whole institution had been completely rearranged. A large proportion of the patients are occupied in work in the hospital. Six nurses and two attendants obtained their R.M.P.A. certificate during the year, and 51 per cent. of the nurses and 48 per cent. of the attendants are now fully qualified.

The *Aberdeen Royal Mental Hospital* housed 803 patients on the last day of last year. Voluntary

patients numbered 29·72 per cent. of the total admissions. The recovery-rate was 27·1 per cent., and the death-rate 8·6 per cent. Malarial therapy is still being used for general paralysis and has given a 40 per cent. remission-rate. A severe outbreak of influenza took place early in the year, and 21 cases of dysentery occurred; search for a carrier was unsuccessful. The dentist visits weekly and the physical benefit derived by the patients from dental treatment has been obvious. A large number of patients were examined radiologically and treated by light, and the occupational therapy department had a successful sale and exhibition in the autumn. A pavilion for tuberculous women has been opened and will take 20 patients. Twelve patients have had parole outside the grounds, and 68 within them.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 29TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 449 (last week 361); scarlet fever, 2540; diphtheria, 1598; enteric fever, 46; pneumonia, 1367; puerperal fever, 71; puerperal pyrexia, 99; cerebro-spinal fever, 15; acute poliomyelitis, 1; acute polio-encephalitis, 2; encephalitis lethargica, 17; typhus fever, 1; continued fever, 1; dysentery, 6; ophthalmia neonatorum, 95. No case of cholera or plague was notified during the week.

The case of typhus was notified in the Metropolitan Borough of Shoreditch. The patient is a girl of 15 who with her mother has been admitted to the Western Fever Hospital and is still under observation. Up to the present the Weil-Felix test is negative in both mother and daughter.

The number of cases in the infectious hospitals of the Metropolitan Asylums Board on April 1st–2nd was as follows:—Small-pox, 570 under treatment, 28 under observation (last week 545 and 23 respectively), scarlet fever, 2125; diphtheria, 2750; enteric fever, 20; measles, 1052; whooping-cough, 74; puerperal fever, 26 (plus 16 babies), encephalitis lethargica, 122; poliomyelitis, 1; "other diseases," 26. At St. Margaret's Hospital there were 12 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns including London there was one death from small-pox, 2 (0) from enteric fever, 159 (80) from measles, 15 (5) from scarlet fever, 46 (3) from whooping-cough, 57 (17) from diphtheria, 58 (16) from diarrhœa and enteritis under two years, and 76 (11) from influenza. The figures in parentheses are those for London itself.

The death provisionally classified to small-pox was assigned to Tottenham Urban District (Middlesex); we understand that cerebral hæmorrhage was also mentioned as a cause of death. The deaths from enteric fever outside London were reported from Bath and Doncaster. Fatal cases of measles were more widely distributed with larger numbers at Manchester, 8; Portsmouth, 7; Middlesbrough, 6; and Chester, 4. (Glasgow also reported 10 deaths.) Whooping-cough claimed 4 victims at Birmingham; 3 each at West Ham; Bootle and Middlesbrough. Diarrhœa accounted for 5 deaths each at Stoke-on-Trent and Manchester. Leeds reported 6 deaths from influenza; Manchester, 4; and South Shields, 3.

The number of stillbirths notified during the week was 305 (corresponding to a rate of 41 per 1000 births), including 59 in London.

ROYAL MEDICAL BENEVOLENT FUND.—The following is an additional case relieved at the last meeting:—

Widow, aged 56, of L.R.C.P. & S. Since the death of her husband in 1919 the widow by keeping a boarding house has maintained herself and educated three children. The children have now all obtained posts and commenced to earn. During the last two years, although the widow has been extremely hardworking and is a very thrifty woman, the boarding house has not brought in a profit. This is due to competition and general depression in the district. Rates fell into arrears and debts were outstanding. Fund voted £40 to pay the rates.

Subscriptions may be sent to the hon. treasurer, Sir Charters Symonds, at 11, Chandos-street, Cavendish-square, W.1.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

MENTAL TREATMENT BILL.

THE Mental Treatment Bill was further considered by Standing Committee A of the House of Commons on Thursday, April 3rd. Mr. CECIL WILSON was in the chair.

Transference of Powers and Duties.

On the Second Schedule, which transfers certain powers and duties under the Lunacy Acts, 1890 and 1891, to the Board of Control,

Dr. MORRIS-JONES moved the deletion from the Schedule of Subsection (3) of Section 242, Subsection (4) of Section 243, and Section 250 of the Lunacy Act, 1890.

Miss LAWRENCE, Parliamentary Secretary to the Ministry of Health, said that if the amendment of Dr. Morris-Jones was carried it would mean that there would be no central control, either by the Board of Control or the Ministry of Health, over the functions of the local authorities. She was certain that that was not the hon. Member's intention, and therefore she asked him to withdraw.

Dr. MORRIS-JONES said that personally he was not afraid of the Board of Control to anything like the same extent as some members of the Committee. He thought, and was still of that opinion, that it would be a waste of time for local authorities to be obliged to submit contracts, agreements, and such matters of detail to the Board of Control, and that it would hamper schemes which were in hand. Nevertheless, he realised after hearing Miss Lawrence's explanation that his amendments went rather deeper than he had thought, and he would therefore withdraw.

The amendment was withdrawn.

On the question that the Second Schedule stand part of the Bill,

Dr. VERNON DAVIES said that the Schedule transferred to the Board of Control some very important duties, some of which he would be delighted to see handed over to the present Board. The new Board, however, as constituted under this Bill, had not his approval to anything like the same extent as the old one, and he anticipated some difficulty in the future with the local authorities in regard to the extension of bureaucratic control. In time to come reflections would be cast on that Committee for passing this Bill. He still hoped, however, that at a later stage the Minister of Health might be a little more amenable to argument and pressure, and might possibly meet them to a certain extent with regard to the powers of the Board of Control. If he did so, the Schedule would be admirable in every respect.

Mr. KINLEY said that he must oppose this Schedule in its present form. The step proposed was in the wrong direction, and cut across what had always been considered as the right and safe course of development in Government, both national and local; that was to say, that in the services which were definitely recognised as public services there should be a direct link between the local authorities and the central authority. They were now bringing in a third party, and giving it duties which had hitherto been rightly considered as duties which devolved on the central authority.

Mr. GREENWOOD, Minister of Health, said that the Committee had agreed to the transfer of these powers. They must not assume that the Board of Control had hitherto had negligible powers, and the Minister had had enormous powers; that was not the case. Under the principal Act the big powers had always resided in the Board of Control, and all that they were transferring now were matters of administrative detail in regard to which in the past there had been unnecessary duplication. The Royal Commission came to the conclusion that it was obviously absurd to have duplication of effort and the inevitable delay which it caused. Transfer in the other direction would mean the complete obliteration of the Board of Control under the principal Act. That was never contemplated. As they had reorganised the Board of Control under this Bill, and as it was quite clear from statements which had been made that it would always act in consultation with the local authorities, the fears of hon. Members were unfounded.

The Schedule was added to the Bill.

Rules.

On the Third Schedule, which deals with matters respecting which Rules may be made by the Board of Control,

Mr. GREENWOOD moved at the end of paragraph 3 to insert the words:

4. Applying to temporary patients received under Section 5 of this Act, subject to such modifications and adaptations,

if any, as appear to the Board to be necessary or convenient the following provisions of the principal Act, that is to say, Section 40 (which regulates the use of mechanical means of restraint), Section 41 (which relates to the letters of patients), Section 42 (which relates to the posting of notices), Section 47 (which relates to the visits of friends), Section 49 (which empowers the Board of Control to order the examination of a patient by two medical practitioners), Section 50 (which relates to inquiries as to property), Section 51 (which relates to searches in the records of the Board of Control), and Section 85 (which provides for the retaking of patients who have escaped).

5. Modifying and adapting, in relation to institutions maintained by local authorities not being mental hospitals, the provisions of Sections 275 to 278 of the principal Act (which relate to the making of general rules and regulations and the appointment and duties of certain officers).

He said that the first paragraph of the amendment was proposed as a result of representations made to his department that these provisions of the principal Act, which now applied only to certified patients, should apply also, with necessary adaptations, to temporary patients received under Clause 5. He hoped that these precautions would not be necessary in very many cases, but they were being inserted as an additional safeguard to the patient.

Dr. VERNON DAVIES said that he was not altogether prepared to agree that this amendment was an additional safeguard to the patient. What they were doing was to treat temporary patients as certified patients, while not calling them certified. That might be to the advantage of the patient, or it might not. For instance, the provision which regulated the use of mechanical means of restraint might be absolutely necessary, and he thought it should be in the Bill. The provision relating to the letters of patients did not appeal to him to quite the same extent, though it was probably a small point. The authorities would be acting illegally in keeping a definitely certifiable patient as a temporary patient, and perhaps the Board of Control should be given the power to order the examination of a patient by two medical practitioners. He could imagine, however, that it was likely to cause difficulty.

Mr. GREENWOOD said that the Sections in the principal Act were designed for the benefit of a person in a mental hospital. It was surely desirable that these forms of safeguard should apply to people who were only temporary patients. Section 49, which provided for the patient to be examined, did not necessarily mean certification, because the Section ended with the words: "the commissioners may order the patient to be discharged."

Dr. MORRIS-JONES said that when he first read the amendment he was rather inclined to think that they were treating the patients under Clause 5 as if they were certified lunatics, but on reading it more carefully he realised that it was necessary. At any moment these patients might be in such a state that they required in their own interests some of the safeguards which the Minister proposed.

The amendment was agreed to and the Schedule was added to the Bill.

Repeals.

On the fourth Schedule (Repeals),

Mr. GREENWOOD moved an amendment to provide that Section 229 of the Lunacy Act, 1890, should continue to operate in the case of voluntary patients who submitted themselves for treatment before this Act came into force. He said that if a person submitted himself for voluntary treatment on the understanding as the law now stood that he could secure his freedom at 24 hours' notice, it would be unfair to tell him that if he was under treatment after January 1st next he could not get out under 72 hours' notice. These people, however, would gradually disappear.

The amendment was agreed to.

The Committee stage of the Bill was concluded, and the Bill was ordered to be reported to the House.

HOUSING (SCOTLAND) BILL.

On April 3rd, Mr. WILLIAM ANDERSON, Secretary of State for Scotland, presented the Housing (Scotland) Bill, a measure "to make further and better provision with respect to the clearance or improvement of unhealthy areas; the repair, demolition, or closing of insanitary houses, and the housing of persons of the working classes in Scotland; to amend the Housing (Scotland) Act, 1925, the Housing, &c., Act, 1923, the Housing (Financial Provisions) Act, 1924, and other enactments relating to housing subsidies; and for purposes connected with the matters aforesaid."

SLUM CLEARANCE BILL.

In the House of Commons on April 7th Mr. GREENWOOD (Minister of Health), in moving the second reading of the Housing (No. 2) Bill (the main provisions of which were described in an article in THE LANCET last week), said that the problem of the slums was becoming more difficult year by year, partly because of the progressive decay of the old slums, and partly because of the deterioration in recent years of more and more property to the slum level. Progress in slum clearance had been deplorably slow. In the 30 years before 1919, 75 schemes were confirmed, of which 43 had been completed. The number of houses and other buildings in the confirmed schemes was approximately 15,000. The number of persons whom it was desired to rehouse was about 74,000. The number of houses that were to be built was 12,000; the number of houses that had already been demolished was between 8000 and 9000; and the number of houses actually completed during the ten years just closed was only 9743—a tragically small contribution to the solution of a problem which had become more serious within the last ten years.

Cumbersome Legal Machinery.

The first reason why they had not been successful in dealing with the problem was the complicated law and procedure at present necessary in order to get a clearance scheme through and completed. The machinery was too cumbrous to be effective. Apart from that difficulties had arisen from the decision of the courts in the case of Rex *v.* the Minister of Health *ex parte* Davis—what was known as the Derby case. The effect of that decision had been to hold up progress in many parts of the country. That was one of the matters dealt with in this Bill. The second obstacle to a successful attack on the slum problem was the existing grant and all that that involved. It was quite clear that the grant by the Ministry of Health of 50 per cent. of the estimated net annual loss was inadequate and placed too heavy a burden on local authorities. The meticulous and detailed supervision associated with the grant was both a discouragement to local authorities and an inevitable cause of delay. The third reason for their slow progress in recent years was that local authorities had in the forefront of their minds what he might call normal housing requirements, and their energies had gone in that direction. But the time had now arrived when, while pursuing building under the Act of 1924, local authorities should deal in a generous way with the problem of the slums. To enable them to do so it was clear that they must eliminate unnecessary procedure, secure more practical and less cumbrous arrangements, and give the local authorities greater freedom and greater financial assistance. It was important in addition to tighten up in some respects the existing law in order to make it more effective and also to enable local authorities to stop the degradation of new districts towards the slum level. That was broadly proposed in the Bill. Within the limited possibilities of reconditioning he hoped that the powers which the local authorities already had would be used. The Bill introduced rational reconditioning in a new way.

The Financial Aspect.

Dealing with the financial side of the Bill, Mr. Greenwood said that a grant-in-aid would be given to local authorities for dealing with clearance areas, improvement areas, and the demolition of individual houses, and the persons rehoused in any of these ways would be eligible for a grant. The grant was a grant per person—per man, woman, and child. The basis had been fixed so that the proportion of the cost borne by the local authorities should be diminished and the rate charge therefore proportionately reduced. The amount they had arrived at after consultation with the local authorities was 45*s.* per year for 40 years per person rehoused under this Bill. For agricultural districts the grant would be 50*s.* per person for 40 years. In London and one or two other places where conditions were such that a considerable amount of rehousing must take place on the site where the people were living, and there must be tenement provision, there would be an additional 25*s.* per person for 40 years. So far as rents were concerned, the local authority would be able to charge such reasonable rents as they thought fit and to differentiate according to the ability of the tenants to pay. He estimated that it would be possible in the normal case to let half the houses built under this Bill, on a broad average, at least 2*s.* a week less than the rent at present charged for houses under the existing scheme. That would make it possible to accommodate displaced persons, as to half of them at any rate, in houses where the rent would be as low as 5*s.* a week plus rates, and the other half in houses at rents of 7*s.* a week plus rates. That would mean a substantial relief to the hard-pressed slum-dweller. Part IV. of the Bill dealt with rural houses, and its object was to secure more energetic and comprehensive treatment on the rural housing problem.

An Opportunity for Local Authorities.

He hoped that the Bill would commend itself to the House and would be speedily passed into law. He hoped that the local authorities would seize the measure with both hands and extract from it 100 per cent. of what value it contained. He also hoped that with this new measure in their hands the local authorities would pursue to the very

end with real vigour, zeal, and determination the final conquest of the slums. If they did so they would have behind them the active support of a large body of public opinion. When the time came that every overcrowded family had a decent home, whatever it might have cost in treasure, the nation would have rid itself of a gigantic burden of disease, misery, and degradation, and would have done what it ought to have done before and have laid one of the essential foundations of civilised society—the home of the people.

An Unhappy Legacy.

Mr. NEVILLE CHAMBERLAIN said that Mr. Greenwood had treated this subject of slum clearance with an absence of party passion which he warmly welcomed because though on remedies there must, no doubt, be differences of opinion in the House, yet as to the urgency of the problem, the extent of it, and the necessity for finding some remedy all Members of the House were agreed. This generation did not make the slums; they were the unhappy legacy left to us from a time when the principles of public health were not understood and when the standards were very different from what they were to-day. To-day, however, public opinion and the public conscience were awake to the evil of the slums more acutely than ever before. The fact, however, that these conditions had been known to exist since the war, and had not been put right, was most eloquent testimony to the extraordinary difficulty of the problem which Mr. Greenwood was attempting to solve. It certainly had not been for want of trying. He agreed that when they considered the number of houses and persons whose conditions had been improved since 1919 under various slum clearance schemes they appeared deplorably and lamentably small. The worst feature of the slums was overcrowding. If there were no overcrowding the slum problem would be cut in half, and it was the recognition of that fact which since the war had caused the local authorities to concentrate nearly all their attention on the provision of new houses. Their efforts had been remarkably successful, but it was only within the past year or two that he had felt that the local authorities had been sufficiently relieved from the grinding pressure of building new houses to enable them to turn their eyes towards the problem of the slums with any prospect of success. The Bill was not what they had hoped for. It contained very little that was new, but he thought it would produce some effect. The Conservative Party would vote for the second reading and at subsequent stages try to make it a little better and more practicable than it was at present.

A Menace to Women and Children.

Miss LLOYD GEORGE said that the condition of many of the workmen's houses in the country districts was very bad. A report published some years ago showed that in her constituency of Anglesey the death-rate from tuberculosis for women was the highest but one in the whole of the administrative counties in England and Wales. Yet the death-rate for men, who were able to get out into the open air more than the women, was only 22. There could be only one explanation of that, and that was bad housing. The greater menace to the health of the women, who spent the greater part of their lives in dark and ill-ventilated cottages, applied also to young children. It accounted for the fact that in 1927 the infant mortality-rate in Anglesey was equivalent to 93 per 1000, which was alarmingly high.

General Support of M.O.H.'s.

After further debate,

Lieut.-Colonel FREMANTLE said he joined in the general feeling of the House that this Bill was a long overdue measure and one which called for the Council of State which the Prime Minister had so cordially asked all parties in the House to combine and create. He had the honour of speaking for the whole body of medical officers of health. As a past President of the Society of Medical Officers of Health, and as one who did perhaps as much as anyone before the war as a medical officer of health to bring before his colleagues in his profession the necessity for dealing with the housing problem, he spoke on their behalf, though without direct mandate, when he said that they wished the greatest measure of support to be given to this Bill in general and at the same time the most meticulous criticism of its details in Committee. They must be perfectly frank in dealing with this problem or they would not be able to deal with it. It was perfectly useless to compare the vital statistics of one slum area with those of the area surrounding it. People lived in the slums by reason of bad fortune of one kind or another. It was often a case of mental deficiency, heredity, and poverty.

Mr. LOGAN: Does the hon. Member suggest that the slum-dweller is a mental degenerate?

Lieut.-Colonel FREMANTLE asked the hon. Member to notice what he had said. Slum-dwellers included mental degenerates. People would not live in slums if they could help it. He believed that his opinion would be endorsed by medical officers of health. One of the greatest merits of this Bill was its continuity, that it really preserved a general continuity in regard to housing measures which were gradually getting to work. Medical officers of health generally throughout the country recognised that there had been an improvement in housing. They looked forward to the result of the census of next year which would tell exactly the state of overcrowding as compared with 1921. They would then have very definite data on which to proceed. Meanwhile, all the reports of medical officers went to show that there was an improvement in housing accommodation, although there had been a great change in the transportation and disposition of population. There had been a greater gravitation towards Greater London which had made the position in London more difficult. The same was true of other big centres. The Bill was supposed to enable them to close houses and to demolish slum areas and at the same time to build houses. He hoped that it might be so. Medical officers of health had been working for a long time on this question of closure and demolition of houses. Closing and demolishing orders had unfortunately been a dead letter since 1914 and the result was that in a recent report from the medical officers of health in England and Wales, of 2500 houses recommended for closing and demolition only 500 were demolished. That was because there was not a sufficient supply of new houses. No measure—not even the present Bill—would be any good unless it helped to provide new houses in which to rehouse persons removed from the slum areas. One very material reason for delay in clearing slum areas was the Rent Restriction Act which was not dealt with in this Bill. A very great difficulty had always been that where there was a recognised injustice under the law the local authorities would not put it into force. Medical officers of health would welcome certain parts of the Bill. In Clause 17 there was a very valuable power which enabled part of a house to be closed without closing the house altogether. There was also valuable provisions in the improvement clause which were really the only novelty in the Bill. The provision for the aged should be extended. The method of subsidy was also a valuable feature. It attacked overcrowding which was really the greatest difficulty of all.

The debate was adjourned.

The Financial Resolution.

On April 8th the debate on the second reading of the Housing (No. 2) Bill was resumed.

The second reading was agreed to without a division.

The House then went into Committee on the financial resolution in connexion with the Bill.

Miss SUSAN LAWRENCE (Parliamentary Secretary to the Ministry of Health) said that the Government did not give any estimate of the cost of the scheme because they did not know what the cost would be. If the response of the local authorities was satisfactory the cost would be very great. If, on the other hand, the scheme was a failure it would cost nothing.

The resolution was agreed to.

HOUSE OF COMMONS.

WEDNESDAY, APRIL 2ND.

Ministry of Health and Test Work.

Mr. HORE-BELISHA asked the Minister of Health whether he proposed to publish the Report of the Ministry's inspectors on the position of test work.—Mr. GREENWOOD replied: I propose to publish the report on the inquiry.

Scientific Inquiry on Anthrax.

Dr. SALTER asked the Home Secretary whether he was now in a position to present an interim report upon the investigations carried out by the Scientific and Industrial Research Committee on the disinfection of hides and skins from anthrax.—Mr. SHORT, Under Secretary to the Home Office, replied: These investigations are being carried on not by the Department of Scientific and Industrial Research, but by the British Leather Manufacturers' Research Association, but some account of the progress of the research is given on page 130 of the recently published annual report of the department for 1928–29 (Cmd. 3471). I understand that a full account of the results will probably be published in a scientific journal, but my right hon. friend proposes to consult with the Association as to whether some advance statement should not be issued, and he will communicate the result to my hon. friend in due course.

THURSDAY, APRIL 3RD.

Marriage of Mental Defectives.

Mr. SORENSEN asked the Minister of Health whether he had any information respecting the marriage of mental defectives and their offspring; and whether he contemplated

taking steps to prohibit such marriages.—Mr. GREENWOOD replied: References have been made to this matter from time to time in the reports of the Board of Control. Legislation would be necessary in order to prohibit the marriage of mental defectives; and I cannot at present undertake to introduce a measure for this purpose.

Colonies for Mental Defectives.

Mr. SORENSEN asked the Minister of Health how many colonies for mental defectives existed in England and Wales; the total number of patients and attendants respectively; and the total cost; and whether he contemplated encouraging the further establishment of these colonies.—Mr. GREENWOOD replied: There are 35 institutions certified under the Mental Deficiency Acts which may be regarded as colonies, but they are in widely divergent stages of development. The total number of patients is at present 16,592, but I am not in a position to state the number of attendants or the total cost. The cost of colonies is under consideration by a committee recently appointed, and their advice must have a bearing on the question of further provision of accommodation of this type.

Board of Control and Mental Treatment.

Mr. KINLEY asked the Minister of Health the average number of patients per doctor in the institutions under the jurisdiction of the Board of Control.—Mr. GREENWOOD replied: As regards institutions under the Lunacy Act, the average number of patients to each member of the resident medical staff is: (*a*) in county and borough mental hospitals, 280; (*b*) in registered hospitals, 61; and (*c*) in licensed houses, 35. Most of these institutions have, in addition to their resident staff, a number of visiting consultants. In mental deficiency institutions the average number of patients to each member of the staff, resident and non-resident, is 111.

Mr. KINLEY asked the Minister of Health the number of institutions under the jurisdiction of the Board of Control in which the approved accommodation was in excess of normal requirements; and what was that excess.—Mr. GREENWOOD replied: There are 44 local authorities under the Lunacy Act who have accommodation in excess of that required for patients within their own area; and the total number of beds is at present 5272. Most of this surplus accommodation is, however, occupied by patients received under reception contracts from other local authorities who have insufficient accommodation or do not own a mental hospital. I am informed that private institutions under the Lunacy Act have sufficient vacant beds to meet normal requirements. In the case of mental deficiency institutions there is no accommodation in excess of normal requirements.

Mr. ROBERT RICHARDSON asked the Minister of Health in how many instances during the past year the Board of Control, in fulfilling their duty of scrutinising documents of certification had discovered that no reason had been stated (as required by Section 32 of the Lunacy Act, 1890); as to why the usual medical attendant of the patient had not been consulted; if he was aware that the omission to give this reason constituted a contravention of an important safeguard; and if he would see that in future that no such omission was allowed to pass unnoticed.—Mr. GREENWOOD replied: Statistics are not available in regard to this point. But the omission to which my hon. friend refers is a contravention of Section 31 of the Lunacy Act, and the Board of Control return for insertion of the necessary particulars all reception documents which do not comply with the requirements of that Section.

State Grant for Medical Research.

Dr. FORGAN asked the Secretary to the Treasury, in view of the inadequacy of the present endowment of medical research, what action he proposed to take to increase the amount of the annual grant in aid.—Mr. PETHICK-LAWRENCE replied: The present annual grant in aid of the Medical Research Council is £148,000, and I have no reason to think that it is inadequate. My hon. friend must understand that this is by no means the only contribution made by the State to medical research.

Imported Milk and Tuberculosis.

Brigadier-General CLIFTON-BROWN asked the Minister of Health the amount of liquid milk and liquid cream imported into this country in 1929; from what countries they came; and what precautions were taken to see that they were free from tuberculosis.—Mr. GREENWOOD replied: I am informed that 58,460 cwts. of milk and 138,604 cwts. of cream were imported into Great Britain and Northern Ireland in 1929. All the milk, except 406 cwts. from Denmark and the Netherlands, came from the Irish Free State. I am sending the hon. Member a statement showing the countries from which the imports of cream were received. Imports of milk from outside the British Islands are subject to examination for tubercle under the Imported Milk Regulations. There is no examination of imported cream for this purpose.

Small-pox Contacts and Vaccination.

Mr. GROVES asked the Minister of Health if he would issue a memorandum to public medical officials deprecating the vaccination of persons who had been in contact with small-pox, seeing that in cases where the small-pox had already been contracted the operation could only add to the patient's troubles, and in those cases where it had not been already contracted after such exposure the imposition of the operation was, ipso facto, unnecessary.—Mr. GREENWOOD replied: No, Sir. I do not think that I should be justified in adopting the course suggested. I am advised that vaccination, if performed sufficiently soon after exposure to small-pox infection, usually prevents an attack of the disease. If vaccination is performed too late to prevent the disease being contracted it may, nevertheless, modify the severity of the attack.

Management of London Lock Hospital.

Mr. ERNEST BROWN asked the Minister of Health if he was now in a position to announce the reforms undertaken by the board of the Lock Hospital; whether any women had been appointed to its governing board; and, if so, what were their names.—Mr. GREENWOOD replied: The governing body of this hospital have given effect to a number of the recommendations contained in the papers presented to Parliament last July, and I understand that further improvements are in contemplation. I do not consider that the best interests of the hospital would be served by publishing details at the present time of the reforms already effected. As regards the remaining parts of the question, the board of management of the hospital includes the following ladies: Mrs. Hatfeild, J.P., Councillor Mrs. Hendin, J.P., Commissioner Mrs. Lamb, J.P., Lady Leitrim, Miss E. E. MacNeill, and Miss Mowll.

Psittacosis.

Mr. GRAHAM WHITE asked the Minister of Health the number of cases of psittacosis notified during the month of March.—Mr. GREENWOOD replied: Psittacosis is not a notifiable disease, but my department has received information of 20 cases of illness which commenced last month, and in which the patients had been associated with sick parrots. I am advised, however, that in the present state of knowledge of psittacosis it is not possible to say definitely how many of these persons were in fact suffering from that disease.

Birth Control Information.

Mr. R. S. YOUNG asked the Minister of Health whether it had been reported to him by his medical officers that there were any demands or requests for birth control information from mothers at subsidised welfare centres.—Mr. GREENWOOD replied: Such requests are only occasionally reported by the medical officers of the department.

Lead Paint Prosecutions.

Mr. MCKINLAY asked the Home Secretary the number of prosecutions arising out of the evasion of the Lead Paint Regulation.—Mr. CLYNES replied: These regulations came into force on Oct. 1st, 1927, and no prosecutions were taken in that year. During 1928 and 1929 and the first three months of 1930 proceedings were taken in respect of 33 contraventions and convictions obtained in 31 cases.

MONDAY, APRIL 7TH.

Conditions in Boot Industry in East London.

Mr. MALONE asked the Home Secretary whether he had received the report on conditions of employment in the boot industry in the East End of London, prepared by Dr. A. D. Denning for the Boot Manufacturers' Federation and the National Union of Boot and Shoe Operatives; and, if so, what action he proposed to take.—Mr. CLYNES replied: Yes, Sir. I have now received and perused this report. I find that it draws a most unfavourable picture of the conditions under which this industry is carried on in the East End of London, but that, so far as concerns matters within the purview of my department, the conclusions appear to be based not on facts ascertained by personal observation of the conditions at the works concerned, but almost entirely on impressions derived from unverified ex parte statements. I understand that though Dr. Denning was offered facilities by the Factory Department for the purposes of his investigation he has never discussed the position with the department, and the chief inspector informs me, after consulting the whole of the staff in the districts concerned, that they are unanimously of opinion that the report gives a very exaggerated account. I find also that the report contains statements conveying serious reflections not only on the competency of the factory inspectors, but also on their attention to duty and even on

their honesty—as, for example, that the inspectors have favoured Jewish as against British employers, and that they are open to accept bribes. These allegations which, unless supported by detailed and reliable evidence, ought never to have been put forward, are strongly repudiated by the staff, and I cannot but express my surprise and regret that a report containing such allegations and compiled on the basis I have indicated should have obtained currency before any attempt had been made to subject the accuracy of the statements it contains to an independent test. I understand that the report has now been considered jointly by the Federation of Boot Manufacturers and the National Union of Boot and Shoe Operatives, and that a committee has been appointed to consider what steps should be taken. The chief inspector informs me that he has been invited, and has agreed, to attend a meeting of this committee, and I propose to await the result of that meeting before considering what action, if any, it behoves me to take.

Inspection of Imported Meat.

Mr. THORNE asked the Minister of Health if he was aware that the examination of Argentine mutton for caseous lymphadenitis was becoming less stringent in all centres outside the City of London; that in the ports of London, Liverpool, and Southampton the work of cutting and examining the glands of the sheep was left to dock workers or employees of the importing firms; that carcasses had been passed by the port sanitary authority and afterwards condemned by the City of London inspectors; and whether he was prepared to issue a circular instructing port medical officers to carry out examinations effectively.—Miss SUSAN LAWRENCE (Parliamentary Secretary to the Ministry of Health) replied: The answer to the first part of the question is in the negative. My right hon. friend understands that at some ports skilled men are specially employed whose business it is to cut and expose glands for inspection by officers of the Port Sanitary Authority. With regard to the third part of the question, my right hon. friend is informed that it is not the practice at the Port of London to inspect meat which is destined for the city markets, and will be inspected there. A conference between the medical officers of health of the ports principally concerned and officers of my department took place recently, and the conclusion was reached that no relaxation should be made of the present arrangements for examination. My right hon. friend does not think that any circular on the subject is required at present.

TUESDAY, APRIL 8TH.

Medical Experts and Seven-year Limit Pension Cases.

Mr. GRAHAM WHITE asked the Minister of Pensions the number of seven-year limit cases submitted to the independent medical experts and the results.—Mr. F. O. ROBERTS replied: Up to date about 25 cases of material doubt or difficulty have been or are being referred to the independent medical consultants for consideration and advice, but not more than nine of these have so far been decided, with results unfavourable to the claimants. These figures are not, however, representative as the new arrangements have only quite recently reached their full operation. I may add that during the same period 227 applications have been admitted without reference to the consultants.

Extension and Coördination of Insurance Services.

Mr. MCENTEE asked the Minister of Health whether he was considering the extension and coördination of the national insurance services; and whether he would include in any new legislation for that purpose facilities for small shopkeepers and business men with limited incomes to become voluntary contributors for health purposes.—Miss S. LAWRENCE replied: These matters come within the scope of the Cabinet Committee engaged on a general survey of the existing insurance and pensions legislation.

BELLE VUE SPA, TREFRIW, NORTH WALES.—New pump rooms at this spa, where all forms of arthritis are treated, are to be opened on April 26th by Sir W. Arbuthnot Lane, supported by Dr. R. Fortescue Fox.

RESIDENTIAL SPECIAL SCHOOLS.—The Shaftesbury Society and Ragged School Union is extending the Victoria Home for Crippled Children, Bournemouth, so as to receive 20 more children from 2 years and upwards, following their hospital treatment. The accommodation at the Russell Cotes School of Recovery for delicate children at Parkstone has been increased by 30 more beds. The accommodation in the four seaside residential schools certified by the Board of Education will then be enlarged to 270 places.

Medical News.

UNIVERSITY OF BRISTOL.—At a recent examination the following candidates were approved:—

M.D.—J. F. O. Bodman and T. F. R. Hewer.

LONDON CLINICAL SOCIETY.—A clinical meeting of this society will be held on April 15th at the London Temperance Hospital, where cases will be on view from 8.30 P.M.

ROYAL LONDON OPHTHALMIC HOSPITAL.—The Gifford Edmonds' Prize for 1930, offered for an essay on Central Scotoma, its Pathology and Clinical Significance, has been divided between Dr. Rosa Ford and Miss Laura M. Ligertwood, F.R.C.S.

PRESENTATION TO DR. JOSEPH BEARD.—Dr. Beard, of Carlisle, who has retired from the medical officership of the town, was, on April 1st, presented at a representative gathering of citizens with a casket and cheque in recognition of his 22 years' service.

NATIONAL SMOKE ABATEMENT SOCIETY.—A public conference on by-laws under Section 5 of the Public Health (Smoke Abatement) Act, 1926, will be held on May 2nd at 71, Eccleston-square, Westminster, S.W., at 3.30 P.M. The discussion will be opened by a paper to be read by Mr. C. J. Allpass, chairman, Public Control Committee, London County Council.

INSTITUTE OF PATHOLOGY AND RESEARCH, ST. MARY'S HOSPITAL.—The programme of the year's course of lectures on Pathological Research in its Relation to Medicine has reached us. The lectures will be given as usual in the lecture room of the bacteriological department of the Institute on Thursday afternoons at 5 P.M., beginning on April 24th, when Sir Almroth E. Wright will lecture on Twelve Years' Work on Immunisation of the Blood in vitro. Subsequent lectures will be as follows: May 1st, Prof. John Mellanby, Absorption from the Alimentary Canal. 8th, Dr. W. E. Gye, the Action of Antiseptics on the Virus of Filtrable Tumours. 15th, Dr. Leonard E. Hill, the Physiology of Diving. 22nd, Prof. C. A. Lovatt Evans, Stages in the Investigation of the Physiology of the Heart. 29th, Sir Thomas Lewis, Reactions of the Skin to Cold. June 5th, Prof. G. E. Gask, the Value of Radium in Surgery. 12th, Colonel L. W. Harrison, Development of the Modern Treatment of Syphilis.

MEDICAL SUPERINTENDENTS' SOCIETY.—The annual dinner of this society took place at the Holborn Restaurant on March 28th, Dr. E. W. G. Masterman, president of the society, being in the chair. Amongst the 93 members and guests present were Dr. Barrie Lambert, chairman of the Central Health Committee, London County Council; Dr. W. Allen Daley, Dr. J. Brander, and Dr. J. A. H. Brincker, principal medical officers of the Council; and Dr. J. J. Buchan, president of the Society of Medical Officers of Health. Dr. Daley, in proposing The Society, recalled incidents in its 43 years' history. Dr. Masterman, in reply, said the name of the society had been changed so as to include medical superintendents of all public hospitals and of voluntary hospitals and whole-time medical officers in responsible charge of patients in public hospitals or institutions for the sick. Dr. Lambert, replying for The Guests, emphasised the need for coöperation between medical superintendents and the London County Council in its enormous task. Dr. Buchan spoke of liaison between the curative and preventive sides of medicine.

SEAMEN'S HOSPITAL SOCIETY.—A dinner was held at the Mansion House, London, on April 8th, in aid of the funds of the Hospital for Tropical Diseases, Endsleigh-gardens. The Duke of York, who presided, said that the work of the hospital fell into three main sections: treatment, research, and education. In addition to officers and men of the Mercantile Marine, persons of every race, nationality, and creed received treatment. Research into the causation and prevention of tropical diseases carried on in the laboratory of the hospital had resulted in discoveries which had rendered habitable vast tracts of country, while the instruction given to members of the medical profession destined to practise in the tropics carried expert knowledge to every corner of the tropical world. The new lecture theatre would be known as "The Manson Clinical Lecture Theatre" to remind students of the source of inspiration from which their knowledge sprang. The necessary alterations and extensions to the hospital would cost £35,000. Lord Passfield praised the work of the School of Tropical Medicine, Sir Arthur Clarke and Dr. G. Carmichael Low replied. Sir Leslie Wilson announced that promises for £10,000 had been handed to the Duke of York during the evening.

BOMBAY MEDICAL COUNCIL.—At a meeting of the Council held on Feb. 10th, Major-General W. H. C. Forster, I.M.S., the new President, was introduced to the Council by Sir Temulji Nariman.—The Council resolved to recognise as an additional qualification the Diploma in Ophthalmology now granted by Bombay University.

ROYAL SANITARY INSTITUTE.—A meeting is to be held on May 2nd, in the Town Hall, Tunbridge Wells, when discussions will take place on the Maternity Home as a Health Asset, to be opened by Dr. F. Churchill Linton, and on Can the Slum be Abolished ? to be opened by Mr. H. T. Taylor.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.—The sixteenth annual conference will be held on July 3rd, 4th, and 5th next, in the British Medical Association House, London. It is proposed to concentrate attention on the effects on the Tuberculosis Campaign of the Local Government Act, 1929. The subject will be introduced by Sir George Newman, followed by Dr. John Parlane Kinloch.

ROLLER SKATING ACCIDENTS.—The Board of Management of Worksop Hospital has decided that patients suffering from accidents while roller skating shall not, in future, receive free treatment, even although they are members of the Contributory Scheme.

EAST LONDON HOSPITAL FOR CHILDREN.—At the annual meeting of this hospital last week Sir Percy Shepherd, who presided, pointed out that the completion of the buildings could no longer be postponed, the accommodation for the nursing staff alone having been severely criticised by King Edward's Fund as totally inadequate to modern requirements. The work will cost £25,000.

SCUNTHORPE ISOLATION HOSPITAL.—This hospital at Brumby, near Scunthorpe (Lincs.), was opened last week by Lord Heneage, the chairman of the Lindsey County Council. The accommodation includes a scarlet fever block, a cubicle block of eight beds separated by glass partitions for other fever cases, a tuberculosis pavilion, and a children's playroom.

THE DIFFICULT CHILD AS A MEDICAL, SOCIAL, AND PSYCHOLOGICAL PROBLEM.—A series of six lecture-discussions on this subject will be delivered by the officers of the Child Guidance Clinic of the Jewish Health Organisation of Great Britain, on Mondays and Thursdays, at 5.15 P.M., beginning on May 19th. The meetings will take place at Toynbee Hall, Commercial-street, London, E. Dr. F. C. Shrubsall will take the chair at the first lecture, on the General Nature and Scope of the Problem and its Treatment, which will be delivered by Dr. Emanuel Miller. Dr. Noel H. M. Burke will speak on the Management of a Clinic on May 22nd and on Physical Factors on June 2nd. Dr. Emanuel Miller will give the concluding lecture on the Rôle of the Psychiatrist on June 5th. Tickets for the course, which is meant chiefly for officers and workers connected with schools, homes, and clubs in the East End of London, may be obtained from Child Guidance Clinic, Jews' Free School, Bell-lane, Spitalfields, London, E.

Medical Diary.

SOCIETIES.

CHELSEA CLINICAL SOCIETY.
TUESDAY, April 15th.—7.30 P.M., Dinner at the Hotel Rembrandt, Thurloe-place, S.W., followed by a discussion on Coughing. Openers: Dr. R. A. Young and Mr. Philip Franklin.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, April 14th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose, and Throat Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Med., Surg., Nose, Throat, and Ear Clinics. Operations.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.
TUESDAY, April 15th.—5 P.M., Mr. A. L. Walker: The Management of Toxæmias.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL.
FRIDAY, April 18th.—4 P.M., Mr. J. D. McLaggan: The Indications for the Removal of Tonsils and Adenoids in Children.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, April 16th.—4.15 P.M., (at the Western Infirmary), Dr. John Gracie: Medical Cases.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
TUESDAY, April 15th.—4.15 P.M., Mr. J. Howson Ray: Hydatid of the Liver.

Appointments.

ADAMSON, A. F., M.D., Ch.B. Edin., has been appointed Medical Officer of Health, Hendon.

ADAMSON, OSWALD J. W., L.R.C.P. Lond., M.R.C.S., Honorary Clinical Assistant to the Ophthalmic Department, Royal Sussex County Hospital, Brighton.

BAINBRIDGE, MARION L., M.B., Ch.B. Manch., Asst. Welfare Medical Officer, Durham County Council.

COLVILLE, E. T., M.D., B.S. Durh., D.P.H., Medical Officer of Health, Bridlington.

DRURY, K. K., M.D., B.Ch., D.P.M. (T.C.D.), Medical Superintendent of the Leicester and Rutland Mental Hospital, Narborough, nr. Leicester.

KELLY, D. H., M.B., B.Ch., N.U.I., House Surgeon, North Riding Infirmary, Middlesbrough.

MORLEY, J., M.B., Ch.M. Manch., F.R.C.S. Eng., Lecturer in Systematic Surgery in the University of Manchester.

PURCE, G. R. B., M.B., M.Ch. Belf., D.P.H., Hon. Asst. Surgeon, Royal Victoria Hospital, Belfast.

RAYNER, E. C., M.B., B.Ch. Camb., Certifying Surgeon, under the Factory and Workshop Acts for the Hythe District of the County of Kent.

Queen Charlotte's Maternity Hospital: JENNINGS, H. T., M.B., Ch.B., F.R.C.S.E., Senior Resident Medical Officer; FLEW, J. D., M.R.C.S., L.R.C.P. Lond., Assistant Resident Medical Officer; WRIGHT, ELSIE, M.B., B.S. Lond., District Resident Medical Officer; PARSONS, FLORENCE, M.R.C.S., L.R.C.P. Lond., Resident Anæsthetist.

Certifying Surgeons under the Factory and Workshop Acts: CHILLINGWORTH, H. F., L.R.C.P. Lond., M.R.C.S. (Bodmin, Cornwall); and LATHAM, T., L.R.C.P. Lond., M.R.C.S. (Sandbach, Chester).

Medical Referees under the Workmen's Compensation Act: ALCOCK, A., M.B., B.S. Lond. (Circuit 53); GEDDIE, M.B., Ch.B. Aberd. (Circuit 4); and STALKER, J. M., M.B., Ch.B. St. And. (Dundee District of Forfar.)

Vacancies.

For further information refer to the advertisement columns.

Aberdeen Royal Hospital for Sick Children.—Two H.P.'s and Two H.S.'s.
Aden Settlement, Arabia.—M.O.H. 800Rs. per mensem.
Alberta, Canada.—Municipal Doctor. $2000 per annum.
Aylesbury, Royal Buckinghamshire Hospital.—Res. M.O. At rate of £200.
Barrow-in-Furness, North Lonsdale Hospital.—H.S. £175.
Basingstoke, Park Prewett Mental Hospital.—Jun. Asst. M.O. £350.
Bath, Royal United Hospital.—H.S. Asst. H.S. At rate of £150 and £100 respectively. Also H.P. £120.
Bedford County Hospital.—H.S. At rate of £175.
Beit Memorial Fellowship for Medical Research.—Jun. Fellows. £400.
Birmingham General Hospital.—H.P. £70.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. At rate of £120.
Bournemouth County Borough.—Asst. M.O., &c. £650.
Bradford Royal Infirmary.—H.P. and H.S. Each £150.
Brighton, Royal Alexandra Hospital for Sick Children.—H.P. £100.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.
British Guiana, Georgetown.—M.O.H. £800.
British Medical Association.—Asst. Med. Secy. £1000.
Burnley, Victoria Hospital.—H.P. At rate of £150.
Burton-on-Trent General Infirmary.—H.S. £150.
Cardiff Royal Infirmary.—Aural H.S. At rate of £75.
Carshalton, Queen Mary's Hospital for Children.—Jun. Asst. M.O. £500.
Charing Cross Hospital, W.C.—Physician for Mental Disorders.
Chester Royal Infirmary.—Hon. Surgeon.
Connaught Hospital, Orford-road, E.—Sen. Res. H.S. At rate of £150. Jun. Res. H.S. At rate of £100. Also M.O. for Electro-therapeutic, &c., Depts.
Dundee Royal Infirmary.—Two Asst. Visiting M.O.'s
Durham County Council.—Asst. M.O. for Public Services. £800.
Durham County Hospital.—Jun. H.S. At rate of £120.
East London Hospital for Women and Children, Shadwell, E.—Cas. O. At rate of £125.
Edinburgh Corporation.—M.O.H. £1500.
Elizabeth Garrett Anderson Hospital, Euston-road.—Asst. Radiologist. £100.
Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £150.
Exeter, Royal Devon and Exeter Hospital.—H.S. to Spec. Depts. At rate of £150.
Folkestone Borough.—Asst. M.O.H. £600.
Gloucestershire Royal Infirmary.—2nd H.S. At rate of £100.
Halifax Royal Infirmary.—First H.S. also Third H.S. At rate of £175 and £100 respectively.
Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—H.S. At rate of £100.
Harrogate General Hospital.—H.P. £150.
Hong-Kong.—Medical Officers. £600.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. Also H.P. At rate of £150 and £100 respectively.
Hospital for Sick Children, Gt. Ormond-street, W.C.—Res. M.O. for Country Branch Hospital, Tadworth. At rate of £250.
Hospital for Women, Soho-square, W.—Res. M.O. At rate of £100.

Hove, Lady Chichester Hospital.—Jun. H.P. £50.
Huddersfield County Borough.—M.O.H., &c. £1100.
Hull Royal Infirmary.—H.S. to Spec. Depts. At rate of £150.
Indian Medical Service.—Commissions.
Inverness, Northern Infirmary.—H.P. £100.
Kenya Colony Government.—Laboratory Asst. for Med. Dept. £354–£500.
Leicester, City Mental Hospital, Humberstone.—3rd Asst. M.O., and Asst. Pathologist. £600.
Liverpool, Royal Southern Hospital.—H.S. and M.O. Each at rate of £60.
London Hospital, E.—Radiologist.
London Royal Free Hospital, School of Medicine for Women.—Demonstrator in Pathology. £250.
Manchester Royal Eye Hospital.—Jun. H.S. £120.
Manchester Royal Infirmary.—1st Asst. in Clin. Lab. £350. 2nd Surg. Reg. £150. Also Asst. M.O. for Massage and Electrical Dept. £100.
Medical Inspectors of Factories.—£600.
Montrose Royal Asylum.—Asst. M.O. £325.
Newcastle-upon-Tyne, Hospital for Sick Children.—Jun. H.S. Also Res. Sen. H.S. At rate of £100 and £95 respectively.
Nottingham General Hospital.—2nd Cas. O. At rate of £150.
Plymouth, South Devon and East Cornwall Hospital.—Asst. S. Also Surg. Reg.
Preston and County of Lancaster Royal Infirmary.—H.S. At rate of £150.
Prince of Wales's General Hospital, Tottenham, N.—Hon. Asst. P. Also Hon. Surg. Reg. £100.
Queen's Hospital for Children, Hackney-road, E.—H.S. At rate of £100. Also H.P. At rate of £100.
Royal College of Surgeons of England.—Examiners in Anatomy and Physiology, Dental Surgery. Also Examiners under the Conjoint Examining Board in England.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.S. At rate of £100.
St. Helen's Hospital, Lancashire.—Res. M.O. £250.
St. John's Hosp., Lewisham, S.E.—Res. Cas. O. At rate of £100.
St. Mary's Hospital, Institute of Pathology, &c.—Research Studentship.
Salford Royal Hospital.—H.P. Also Cas. H.S. Each at rate of £125.
Samaritan Free Hospital for Women, Marylebone-road, N.—H.S. At rate of £100.
Sheffield Royal Hospital.—Res. Ophth. H.S. Also Res. Anæs. thetist. Each at rate of £80.
Southampton, Free Eye Hospital.—H.S. £150.
Stafford County Mental Hospital.—2nd Asst. M.O. £600.
Stockport Infirmary.—H.P. £175.
University College Hospital Medical School, W.C.—Chair of Bacteriology. £1200.
Wakefield, Clayton Hospital.—Two H.S.'s. Each at rate of £150.
Wigan, Royal Albert Edward Infirmary and Dispensary.—Surgeon-in-charge of Orthopædic Dept.
Wolverhampton Royal Hospital.—Cas. O. and Res. Anæs. At rate of £125.
Worcestershire County Council.—Asst. County M.O. £600.
Worksop, Victoria Hospital.—H.S. At rate of £170.
York, Bootham Park.—Jun. Asst. M.O. £300.

The Chief Inspector of Factories announces the following vacant appointments for Certifying Factory Surgeons: Llanybyther (Carmarthenshire), Maiden Newton (Dorsetshire), Tenbury (Worcestershire), Whitstable (Kent), and Pontypool (Monmouthshire).

Births, Marriages, and Deaths.

BIRTHS.

BURN.—On April 4th, at Gayton-road, Harrow, the wife of J. H. Burn, M.D., of a daughter.

HEWER.—On March 29th, 1930, at 32, Park Village East, Regents Park, to Phœbe, née Champney, wife of Christopher Langton Hewer, M.B.—a son.

ROMANIS.—On April 3rd, at Harley-street, W., the wife of W. H. C. Romanis, F.R.C.S., of a daughter.

VINT.—On April 1st, at "Oaklands," Langton Green, Tunbridge Wells, the wife of Dr. M.D. Vint, of a daughter.

MARRIAGES.

BATHO—GARRETT.—On April 2nd, at the Parish Church Eastleigh, Hants, Edgar Richard Batho, M.C., M.R.C.S. Eng. L.R.C.P. Lond., to Marion Josephine, only child of Dr. and Mrs. R. Reynolds Garrett, of Eastleigh.

DEATHS.

BERGIN.—On March 31st, William M. Bergin, M.B., B.S., F.R.C.S. Edin., of Hanbury-road, Clifton, Bristol, Director of Ashley Down Orphan Homes.

MELLISH.—On March 30th, at Coombe House, Tetbury, Glos., after five years' illness, John Stafford Mellish, M.R.C.S., L.R.C.P., aged 65.

PARRY.—On April 6th, at Park-road, Curzon Park, Chester, Thomas Sharp Perry, M.B., B.S. Lond., M.R.C.S. Eng., L.S.A., in his 81st year.

REYNOLDS.—On Sunday, March 30th, Austin Edward Reynolds, M.R.C.S. Eng., &c., of The Common, Woolwich, and of Finsbury-chambers, E.C., aged 63.

WATT.—On April 2nd, Sir GeorgeWatt, C.I.E., M.B., C.M. Glasg., at his residence at Lockerbie, Dumfriesshire, a few days before completing his 79th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

DANIEL MALTHUS, APOTHECARY, 1651–1717.

BY R. R. JAMES, F.R.C.S.

Daniel Malthus was son to Robert Malthus, Vicar of Northolt, Middlesex, and Sarah, his wife, and was baptized at Northolt on Feb. 15th, 1651. The father was ejected from his living in 1662. According to Calamy "Nonconformists' Memorial" (ii., 460) he was "an ancient divine, a man of strong reason, and mighty in the scriptures, of great eloquence and fervour, though defective in elocution." His parishioners found him so obnoxious that they petitioned Cromwell for his removal, but without effect. He appears to have had a great propensity for engaging in Chancery suits, which bears out the opinion expressed by his parishioners, that "their vicar was fully as partial to the law as to the gospel."

I know nothing of Daniel's early life, but find that he was made free of the Company of Apothecaries in 1678. From Barrett's "History of the Society of Apothecaries" we learn that "in 1704 Mr. Daniel Malthus, the Queen's Apothecary, had prior to the proceedings been called on to the Court of Assistants in virtue of his position. He was then immediately elected Master, but pleading pressure of business was, after paying a fine of £50, excused at present." Morant, "History of Essex," ii., 543, states that he was "apothecary to the very learned Dr. Sydenham, on which account he caused his son to be named Sydenham, and was afterwards Apothecary to King William and Queen Anne. He married Elizabeth, daughter of John Portman, Esq., and had by her, Sydenham Malthus, Esq., his son and heir, one of the six clerks in Chancery and a director of the South Sea Company in 1741."

Daniel Malthus must have prospered in his business, for we find him by indenture dated Dec. 19th, 1702, buying the manor of Hadstock for the sum of £5500 from James Earl of Suffolk (Close Roll, Anne). Sydenham thought highly of Daniel Malthus, for by his will, proved Jan. 4th, 1690, he desires to be buried where his executor and Daniel Malthus shall think convenient. After naming him as one of his trustees, the will continues: "I also give to the said Mr. Malthus, £20 to buy him a piece of plate in remembrance of me, desiring the said Daniel Malthus, for the consideration I have always reposed in him, and the integrity and friendship he hath born to me and my family, and for that he would be assisting to my son William and his family with the best advice and counsel he can give." Malthus was also named a trustee to Sydenham's grandchildren and was bequeathed £10 per annum for his trouble, this sum was, by codicil, reduced to £5 owing to the reduction of the estate of the legatees. Malthus was Sydenham's neighbour in Pall Mall.

Daniel Malthus's Letters.

The following letters are among the Sloane MS. at the British Museum, and are worth reproducing. I have arranged them in chronological order as far as possible.

Sloane MS. 4036, *f.* 279.

SR,—I came to tell you that Mr. Randall's daughter hath used the lotion four nights, and says the pimples are more in number, and larger than they were. If you expect the humour should come out more upon this application, she is contented, but thought fit you should be acquainted with it, I will call here some time tomorrow, if you please to leave order what you will have done or word that you intend to see her, I will give Mr. Randall an account of it.

I am, Sr. yr. humble Servt.,
D. MALTHUS.

Dec. 18, 96.

The next letter is undated, but would appear to belong to the same case.

Sloane MS. 4077, *f.* 61.

SR,—The pimples in Misses face begin to returne, and rather in greater number then before, which much discourages the mother, she speaks of some powder that a friend of hers used by your appoyntment which did cure. I tolde her it was fit you should see it, but she bid me first send you word of it.

I am, Sr., yr. humble Servant,
D. MALTHUS.

Sloane MS., 3041, *f.* 302.

SR,—Dr. Warth and Mr. Shale, attorney are made Comrs. to take care of Sr. Ed. Hannes person, and his Br. in law Mr. Packer for his daughter and estate. They begg of you to consider in wt way it will be best for him to be managed as to Government, lodging, dyet and Physic, and that you will appoint where and when they may receive your advice herein.

I am, Sr. yr. humble Servant,
DANIEL MALTHUS.

Feb. 25, 1708.

Sloane MS., 4041. *f.* 178.

For Dr. Sloane in Bloomsbury Square.

SR,—I am greatly obliged to you in having my health and that of my spouse in your thoughts, for which we returne you our thanks. I thanke God I have recovered my appetite and am in perfect health; and my wife hath been free from spitting of blood and so much better of her cough as to leave off diacodium: however, I hope to persuade her to submit to what you advise as the best thing she can do to preserve her. Sr. Richard Blackmore was here yesterday, and found all as you did: I did not see him, but was told so by Dr. Arbuthnott, who gives his service to you. Her Hs. took the purge today, but I have not yet directions to pursue the rest of the course.

I am, Sr, yr. obliged humble servant,

Windsor Castle, July 10, 1708. DANIEL MALTHUS.

Sloane MS. 4076, *f.* 106.

For Dr. Sloane in Bloomsbury Square.

SR,—Dr. Arbuthnott hath been three days afflicted with a violent cholick with vomiting and pains in his back, which gives him suspicion of stone or gravel, though all his bowells seem affected. Her Majesty order'd that a Physician whom she should chuse should be sent for. He beggs the favour of you, and that you will bring Dr. Oliphant with you, of which I have given him notice, he lives in a new court between Windmill Street and Rupert Street, I thinck it is called Panton Court. I have by his direction acquainted Sr. Rid. Blackmore with his condition, and desired his advice, which will be brought you by the bearer if he meets him, but you will please not to tarry for that, he hath used purging and glysters with Venice treacle and with terpentine and Laudanum. I received your letter and gave Mr. Polter an account of it.

I am, Sr. yr. obliged humble servt.,

DANIEL MALTHUS.

Windsor Castle, Octob. 7, 1709, near 9 in ye forenoon.

(*In the margin*) Pray let the bearer carry Dr. Oliphant word when you will call him.

Sloane MS., 1968, *f.* 2.

SR,—Her Matys. fitt of ague returned this afternoon, and Her Maty. ordered me to desire you to meet her Physicians at the back stairs at eight of the clock tomorrow morning.

I am, Sr, yr. humble Servant,

March 9, 1710/1. DANIEL MALTHUS.

Sloane MS., 4076, *f.* 108.

SR,—Dr. Lawrence and Dr. Arbuthnott begg the favour of you to be at Dr. Arbuthnott's Lodging in St. James's house at eleven a clock in the forenoon tomorrow.

I am, Sr, yr. humble Servant,

May 28, 1713. DANIEL MALTHUS.

Sloane MS., 4043, *f.* 157.

For Dr. Sloane, Her Majesty's Physician in Bloomsbury Square.

SR,—Dr. Arbuthnott desired me to acquaint the phisicians that Her Majesty is very well, but that they were desired to meet at his lodging in St. James's House tomorrow at such time, as they found most convenient. I was with Dr. Laurence, who would accommodate himself to you, but since no time is set he names twelve, unless you should all agree on any other time, and in that case he desires notice may be sent of it to me, and he will comply with it.

I am, Sr, yr. humble servant,

June 25, 1713. DANIEL MALTHUS.

Queen Anne died on August 1st, 1714, three years before her apothecary. Money was owing to him from the royal estate. Treasury Papers, 245, 2, at the Public Record Office give: 18 February, 1722/3. "That there is due from Her late Majesty Queen Anne to the executors of the late Daniel Malthus, Apothecary to her said late Majesty's person, the sum of £301 17*s.* 4¾*d.*—i.e., on his allowance of £320 5*s.* per annum from Xmas 1713–1, August 1714, the sum of £192 7*s.* 4¾*d.*, and on his bills for medicine for the family and other persons at Windsor, etc., and for Spaw water bought by H.M.'s particular order, £109 10*s.* 6*d.* making the above total, and a moiety is ordered out of the first money that shall come into the exchequer of the Queen's arrears."

Daniel Malthus died in 1717 and was buried at Hammersmith. His will is a very short document. "I, Daniel Malthus, of the parish of St. James', Westminster, apothecary, having by God's blessing provided for my children, do by this my last will and testament give and bequeath to my deare wife, Elizabeth Malthus, everything in the world that I have a right or title to, or interest in, and I appoint her sole executrix of my will, this 11th August, 1716." The witnesses are Simon Parry, Sarah Tully, and Elizabeth Baker, and probate was granted July 29th, 1717.

His Appointment as Queen's Apothecary.

With regard to the appointment of Malthus to be the Queen's apothecary the following document in the Public Record Office may prove of interest.

L.C. 3:21. "Whereas in the present Establishment of your office certain salaries and allowances were inserted for James Chase, Esq., and Joseph Pitt, Esq. (who is lately deceased), as apothecaries to our Royal person and it is thereby declared that upon the death or removal of either of them which should first happen the place of him so dying or being removed should cease and determine. And whereas our trusty and welbeloved Daniell Malthus, Esq., is by our discretion sworn and admitted Apothecary to our Royal person in the room of the said Joseph Pitt and it being our intention that the said Daniell Malthus shall have the same salary and allowance as was payable to the said Joseph Pitt Notwithstanding our said former direction (to wit) for his salary £115 p. ann. and for physick for our person and in lieu of bills £205 5*s.* p. ann. amounting in both to Three hundred and Twenty pounds five shillings p. ann. Our will and pleasure therefore is and we do hereby direct and comand that out of such our money as is or shall be impressed to you for the service of your office you forthwith pay or cause to be paid unto the said Daniell Malthus or his assignes so much as the said salary and allowance at the rate of £320 5*s.* p. ann. computed by the day from 22nd day of July last (being the day on wch. he was sworn into the said office) to the 29th day of Sept. following amounts unto And that from thenceforth you pay the said salary and allowance quarterly from time to time as the same shall incurr and become due in like manner as other our Servts. on the said Establishmt. are paid or payable But it is our express will and pleasure that upon the death or removall of him the said James Chase or of the sd. Danll. Malthus wch. shall first happen the place of him so first dying or being removed shall cease and determine and this shall be as well to you for making the said paymts. as to the auditors of the Imprests and all others concerned in allowing thereof from time to time upon your. accots. a sufficient warrant Given at our Court at St. James's this 22nd day of Novr. 1704, in the third year of our Reign.

By Her Matys. Command. GODOLPHIN.

To our Rt. trusty and welbeloved cousin John Viscount Fitzharding. Treasr. etc."

One other extract from the records may perhaps be allowed:—"Windsor, 10, Oct. 1711. To Mr. Danll. Malthus Apothecary to Her Maties, Royall Person for physick for Her Maties, Servants that attended at Windsor and Newmarket in 1706, 1707 & 1708 and for other persons by Her Maties. speciall comand by warrant dat. 21 Febry. 1708, £108 12 9."

Malthus's Descendants.

Daniel Malthus's grandson, Daniel, of Albury, Surrey, was, according to the "Encyclopædia Britannica," "a gentleman of good family and independent fortune, a man of considerable culture both in literature and philosophy, the friend and correspondent of Rousseau and one of his executors, one, too, who showed no little interest in those social problems in which his son was to be an original inquirer." The son referred to in the last sentence was no other than the Rev. T. R. Malthus, the celebrated political economist, whose famous essay on the "Principle of Population" was published in 1798.

The practice of naming the eldest son, or other son, Sydenham has persisted till recent times. The late Colonel Sydenham Malthus, C.B., who was well-known to the writer of this paper, named two sons in succession Sydenham, but each died young. A branch of this ancient family is settled in New Zealand and the sole survivor of the English branch was at school with the writer and is now an engineer employed in the colonies.

Dr. John Arbuthnot survived his attack of stone or gravel and did not die till Feb. 27th, 1735, but Sir Edward Hannes died July 21st, 1710. The latter enjoys the distinction of appearing in a lampoon of the period in company with the notorious ophthalmic imposter, Sir William Read, Queen Anne's quack oculist.

"Great Read and slender Hannes both knights, show
That none their honours shall to merit owe.
That Popish doctrine is exploded quite,
or Ralph* had been no Duke, and Read no Knight,
That none may *virtue* or their *learning* plead,
This has no *grace* and that can hardly *read*."

*Ralph, 1st Duke of Montague.

I am indebted to Payne's "Collections for a History of the Family of Malthus" for much of the information recorded here, and to Mr. Harvey Bloom for transcribing five of the letters in the Sloane MS., and for obtaining the warrant of appointment from the Public Record Office.

SPECIMEN EXAMINATION PAPERS.

A COLLECTION of medical and D.P.H. examination papers for the years 1926 to 1929 has just been issued by Messrs. E. and S. Livingstone, of Edinburgh, for 3*s.* 6*d.* The book includes papers set at the University of Edinburgh Conjoint Board (Triple Qualification) and the Royal College of Physicians of Edinburgh, in the following subjects: Botany, Zoology, Chemistry, Physics, Anatomy, Physiology, Pathology, Materia Medica, Surgery, Medicine, Midwifery and Gynæcology, Forensic Medicine, Public Health, Bacteriology, Entomology and Parasitology, and Elementary Psychology. Parts of the book, therefore, will be useful to medical students at all stages of their career and to graduates who are preparing for higher diplomas.

ESPERANTO AND MEDICINE.

ESPERANTO, the invention of a Polish oculist, Dr. L. L. Zamenhof (1859–1917), has already proved its utility as an international auxiliary language in science, commerce, and social life—the Church might also be included, for there are esperanto translations of devotional books, both Catholic and Protestant, while the whole of the Bible and the New Testament have been translated into the language. If esperanto has not made the progress which the pioneer hoped for when he published his brochure in 1887, there are now signs that its value as an instrument for international communication with a subsequent closer linking of the nations is becoming more recognised. The League of Nations is prepared to use esperanto where its help appears probable, and the British Association for the Advancement of Science takes a similar attitude. Further, according to a recent issue of "International Language," Liverpool University, to which the late Dr. John Buchanan left £4000 for the establishment of a Chair of Esperanto, has an Esperanto Society among its general activities, of which Prof. W. E. Collinson is the president; while Oxford has a similar society, which has received recognition from the University. It is fitting, therefore, that the twenty-second Universal Congress of Esperanto should be held in Oxford from Aug. 2nd to 9th, under the Presidency of Prof. Collinson, and in this connexion a small book of 62 pages, "Esperanto and its Claims,"[1] has been written by Mr. Bernard Long, B.A. Camb., based on a previous booklet, "The Passing of Babel," which discusses the language problem and its solution and answers in brief most of the questions that are likely to arise in the minds of those seeking information.

A section of the Universal Congress has been devoted to medicine, but the auxiliary language having proved its suitability for communications among medical men of different nationalities, a separate congress was inaugurated and was held for the first time in 1929 at Antwerp. The medical esperantists have an "Internacia Medicina Revuo," which circulates in all parts of the world, while Japan has local journals which print medical communications in esperanto and by this means make known medical activities in that country to their confrères in other countries. Japan early recognised the value of esperanto as a means of overcoming the difficulties of their language to foreigners, and several medical monographs have been written in esperanto by Japanese professors of the Pathological Institute of the University of Tokio, while a treatise on pathology with esperanto terminology has also been published in Japan. In Switzerland there is a committee whose object is to interest the medical and scientific professions in esperanto, and in Czecho-Slovakia the movement seems to be slowly spreading, for there are small societies in various parts of the country, an esperanto institute at Prague, and in official circles, and particularly the Ministry of Education, it is favourably regarded as an auxiliary language.

HOLIDAY TOURS.

THE Union Castle Mail Steamship Company are issuing, in connexion with their various tours projected for the summer, a series of interesting pamphlets. The continental cruises are planned fortnightly, commencing April 26th, and the tourists have an opportunity of visiting Antwerp, Rotterdam, and Hamburg for the modest sum of about £20, while they will be absent 13 or 14 days. A trip to Madeira, the Grand Canary, and Teneriffe, can be made for about the same money. The whole trip to Madeira and back can, if necessary, be made in nine days, but opportunities of extension are offered up to any period within two months, the rates being proportionate. A tour to South Africa is offered at specially reduced return fares; the places visited are Cape Town, Algoa Bay, East London, and Natal. For particulars concerning these summer tours, as well as for information upon any of the sailings, application should be made direct to the Company at 3, Fenchurch-street, London, E.C.

A PHOTOGRAPHER'S CALENDAR.

THE British Journal Photographic Almanac, 1930,[2] should prove useful to those who are engaged in any branch of photographic work. The technical information contained in the book includes tables and formulæ, an account of home-made appliances, and an epitome of methods and processes described in photographic literature during the year. An article on the triumphs of interior photography, the editor's reminiscences of the stages through which photography has passed during the last 25 years, and a note on the method of taking telephoto snapshots will be read with interest. The book is illustrated with some beautiful reproductions of photographs.

[1] This booklet and further information is obtainable from the British Esperanto Association, 142, High Holborn, London, W.C.

[2] Edited by George E. Brown, F.I.C. London: Henry Greenwood and Co. Pp. 784. 2s.

SCOTLAND AND MEDICAL EDUCATION.

OUR Scottish correspondent remarked in a recent issue (March 22nd, p. 657) on the large part played by Scottish medical schools in the medical education of the kingdom. No one would want to challenge Scottish supremacy in this respect, but it has been pointed out to us that while the Scottish schools are insistent on all their students registering, this is not the case in the English schools, so that the Students' Register does not give an accurate basis for comparison. London and Liverpool Universities, for instance, as well as the Conjoint Board, do not insist upon the registration of their medical students with the General Medical Council. A statistical table to be found in the Council's Minutes for 1928 (p. 440) shows that nearly 21 per cent. of medical students do not register, and the bulk of omissions are in England. It may be taken that students who register as such in one country generally qualify and are registered as practitioners in the same country, although there is no insistence on this. Whether or not there has been an increase in the number of students in Scotland as compared with those in England it would be difficult to say. That there has been a falling off in the number of English students at Edinburgh University is suggested by the lapse of the English public schools club for want of members. Probably there has been little change in recent years.

NEW PREPARATIONS.

COMPOUND GLYCERIN OF THYMOL PASTILLES (Boots Drug Co., Nottingham).—These pastilles contain the equivalent of one-third of a teaspoonful of glycerin of thymol, and are recommended as a substitute for the glycerin thymol gargles. When an application is required in case of sore throat or tonsillitis they will be found quite serviceable, but obviously such treatment should only be undertaken on medical advice.

REGULOL (Cuxon, Gerrard and Co., Ltd., Oldbury, Birmingham).—This preparation is manufactured from liquid paraffin in combination with agar-agar, and has been found acceptable by patients for whom the natural taste of the oil is very unpalatable, while the addition of agar-agar assists to obviate rectal leakage. The manufacturers have evidence that the drug has been particularly valuable in cases of hæmorrhoids. Regulol is available in two forms, plain or compound, the latter form being a combination made by adding phenolphthalein in the proportion of 4 grains per ounce; this is indicated where the condition of constipation is more obstinate. A sensible direction is given on the bottle, when mentioning the doses, that these can be reduced as the bowel resumes its normal function.

RECURRENT ATTACKS OF SORE TONGUE.

IN reply to the inquiry in THE LANCET of March 8th (p. 548) Dr. Byron H. Jackson (Scranton, Pennsylvania) writes:—"I have treated several such cases, which started with sudden enlargement of the papilla, followed by small ulcers on the sides, some of which became chronic, one patient suffered continually for eighteen months. When she was sent to me she had had many different kinds of treatments, none of which gave her relief. I give a mouth-wash of hydrogen peroxide, 50 per cent. strength, to be used three times daily, after the mouth has been cleansed thoroughly with warm water, and once daily a dental cotton dam is placed in the mouth around the tongue so that the tongue is kept perfectly dry, and the top of the tongue is dried with cotton; then I apply, with a tiny cotton swab, a 5 per cent. solution of salvarsan with glucose. In every instance this permanently cured the condition. There appears to be some connexion between this type of sore tongue and so-called Vincent's angina. In my cases the organism was not isolated. I am therefore working somewhat in the dark."

Messrs. Baillière, Tindall and Cox, and H. K. Lewis and Co., Ltd., ask us to state that the use of their names in an advertisement last week of Dr. Blanchard's "Ambulant Proctology" was without their knowledge or consent.

ANCOATS HOSPITAL.—The relative failure of the appeal for £100,000 for enlargement had necessitated the abandonment of the original scheme. A much modified plan has now been adopted. On the ground that the provision of additional beds would add to the pressure upon the operating theatre and other departments, and require a larger number of nurses, it has been decided to build a new block, providing two new theatres and new pathological and massage departments. Since 1925 the average stay of each patient has been reduced from 16·2 days to 13·8 days. There is a waiting-list of about 1500.

Chadwick Lecture

ENTITLED

HEALTH IN WEST AFRICA.

Delivered in the Lecture Hall of the Medical Society of London on Feb. 13th

BY D. B. BLACKLOCK, M.D. EDIN., D.P.H.,

PROFESSOR OF PARASITOLOGY, UNIVERSITY OF LIVERPOOL; LATE DIRECTOR OF THE RESEARCH LABORATORY, SIERRA LEONE.

WHEN dealing with the subject of health in West Africa, a portion of the Empire which is yearly assuming greater economic and political importance, it is customary to call attention to the improvement which has occurred in the conditions from the point of view of the white man who works there. In the past this procedure of limiting the survey to the health of the white man has been quite natural, because it is obvious that without first of all ensuring a reasonable degree of safety for the health of European officials, white members of commercial houses, personnel of shipping lines and mission workers, no progress can be made. It is only after this preliminary stage has been successfully accomplished that the truly colossal task of rendering those tropical regions reasonably healthy for the indigenous population can be envisaged.

THE HEALTH OF THE WHITE MAN.

I propose in the first place to deal briefly with some figures relating to the health of one group of Europeans in West Africa, to indicate certain gaps in our knowledge in respect to the figures of other groups, and to draw attention to one or two diseases affecting white people, which still baffle our efforts, and which call either for further elucidation by means of research or further reduction by the application of known sanitary measures on a more extensive scale.

Among white people who are subject to the influence of West African conditions the following categories may be mentioned: Government officials, and non-officials, the latter including members of commercial firms, personnel of shipping companies, missionaries, and others. In so far as the first class—namely, the officials—is concerned, I am indebted to Dr. A. T. Stanton, medical adviser at the Colonial Office, for the most recent figures relating to non-native officials in West Africa. On Jan. 1st, 1928, the total number of such officials in the Gambia, Sierra Leone, Gold Coast, and Nigeria was 3894. Of these, it is interesting to note that 339 belong to a quinquennial age-group with central age 50, and that there were no less than 60 individuals whose ages were 54 years and over, the oldest being 69. During the year, 27 officials died and 47 were invalided out of the Service, giving a death-rate of 6·7 per 1000 and an invaliding-rate of 11·7 per 1000; now both these rates are the lowest ever yet recorded for West Africa. When we compare the death-rates of 75·8 and 53·6 per 1000 per annum for the Gold Coast and Lagos respectively during the period 1881 to 1897 inclusive, we realise how great has been the advance.

Perhaps some figures from a non-medical source may be quoted in corroboration of statements as to the reduction of risk to life and health in West Africa during this century. In the *Journal of the Institute of Actuaries*, March, 1927, a paper was published by Mr. H. E. Raynes, Secretary of the Legal and General Assurance Society. In this publication the author points out that the lives on which his figures are based include Europeans of all classes from platelayers to judges; he admits that the retirements on pension for ill-health have had the effect of lightening the extra mortality for ages over 40 among those remaining in the Service; he assesses the invalided lives which pass out without pensions as of the same quality as to extra mortality as the lives pensioned for ill-health, and he comes to the conclusion that for the purpose of life assurance it would appear that an addition of 0·5 per cent. to the rate of mortality throughout the table (England Life Tables No. 8) would fully meet the case so far as these Government servants are concerned.

Colonial Office Figures.

It has sometimes been argued that the administrative cost, including that of the medical officials in the West African Colonies, has been out of proportion to the trade done with these colonies. In so far as the number of officials employed is concerned the figures certainly do not bear out this contention. The two years of 1907 and 1927 may be compared in respect to the number of officials and trade done. The Secretary of the Liverpool Chamber of Commerce has been good enough to provide me with the following trade figures relating to West African Colonies. In 1907 the total imports and exports of the British West African Colonies amounted to £16,345,095, of which the United Kingdom took £10,238,595. In 1927 the total imports and exports had risen to £60,779,476, of which the United Kingdom took £29,449,210. In 1907 the average number of non-native officials in West Africa was 1628, whereas in 1927 the average number was 3637. From these figures we obtain the fact that there were approximately 102 officials in 1907, as against only 60 officials in 1927 for every million pounds worth of trade. We see that great progress in health has occurred, accompanied by a great increase of trade and a great but by no means proportionately great increase in the number of European officials.

There are possible objections to judging the improvement shown in the Colonial Office figures as illustrative of the general health progress, as we are hardly in the position to say as yet that it applies equally to the other groups mentioned. I should like here to draw attention to one point in particular; the Colonial Office records give certain information as regards the official population of West Africa which we have not, but which it would be desirable to have, for the trading and shipping population, as we should then obtain a more complete picture of the undoubtedly remarkable diminution in the risks from disease in West Africa. It is the usual custom in some of the shipping lines serving West Africa as well as in those operating elsewhere, to pay off their personnel the moment the ship arrives at the home port of destination, and to re-engage them afresh for each voyage. Now in the West African trade this arrangement might—one can almost say that it does—lead to serious divergences between the death and sickness and invaliding-rates recorded for employees and the actual facts. With your permission I shall illustrate my meaning by referring again to the Colonial Office figures in which it is shown, you may recall, that 27 officials in the West African Service died in the year 1928. The deaths of these officials did not, however, all occur in West Africa. Of the 27 deaths only 18 took place in West Africa, and no less than eight occurred in the United Kingdom, while one occurred at sea. This illustrates the fact that a man coming from West Africa does not, by the simple process of stepping off the ship at the home port of disembarkation, rid himself of the serious and often fatal diseases which may have undermined his system during his tour of duty. For the full understanding of the health problem as it affects the white man in West Africa therefore, it is necessary to have accurate and reliable figures from the commercial firms and shipping companies, and others, comparable with those which the Colonial Office produces, so that what happens to a man after, and as a result of exposure to the conditions of West Africa, may be known, as well as what happens to him during his actual exposure to these conditions.

Improvement the Result of Scientific Discovery.

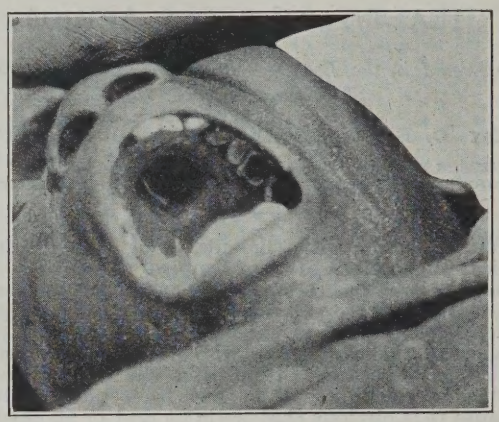
The improvement in the West African figures of death and invalidings since the beginning of this century are in the main the direct outcome of certain scientific discoveries made chiefly by medical men of many different nationalities and made, many of them in parts of the world quite remote from each other and from West Africa.

Manson, a British subject, in 1877 in China discovered that filaria undergoes development in a mosquito. Laveran, a Frenchman, in 1880 in Algiers discovered the parasite of malaria. Smith and Kilborne, Americans, in 1893 in America showed that protozoa in the shape of *Babesia* could be transmitted by ticks. Bruce, a British subject, in 1895 in South Africa associated trypanosomiasis of cattle with the tsetse-fly. Eijkman, a Dutchman, in 1897 in Java showed that fowls took polyneuritis when fed exclusively on decorticated rice. Ross, a British subject, in 1897 in India showed that human malaria parasites commence to develop in anopheline mosquitoes; in 1898 he proved the whole cycle of bird malaria in culicines. Grassi, an Italian, in 1899 in Italy confirmed Ross's work on human malaria. Looss, a German, in 1901 in Egypt demonstrated how hookworm infection occurs. Carrol, Reed, Lazear, and Agramonte, an American Commission in 1901, in Havana proved that Aëdes transmits yellow fever.

These brilliant discoveries in all parts of the world, discoveries made before this century was well begun, were what has rendered possible the progress in health of which the West African Colonies can boast to-day. They form the basis of subsequent work by innumerable observers; every year sees new discoveries and it is the application of the combined results by medical men and sanitarians which has produced the change in the death- and invaliding-rates which I have just given you and which has altered completely our outlook on West Africa, as on the whole of the tropical regions of the world.

Yet this dramatic change is not without its drawbacks; there is, in fact, at present somewhat a danger of an overswing of the pendulum; although the change from a quite obsessional pessimism to a rational optimism as regards West African health conditions has occurred in such a short space of time people are already beginning to lose sight of the fact that it is only by the rigid application of knowledge and by unremitting attention to the details of self-protection that such encouraging results have been obtained in the past and that they can be continued in the future, at least in the near future. There is, I think, a possibility that too much apprehension may be succeeded by over-complacency. People in general, too, have an overestimated idea of what has actually been accomplished in regard to certain matters. For example, I have often been asked about the prevalence of such things as mosquitoes and tsetse-flies in West Africa by people who honestly believe that these things have become quite scarce as the result of the application through sanitation of the findings of research. It is true that such insect pests as those mentioned and many similar carriers of human diseases may be quite scarce in a given compound or a single village or even in a particular town, but to speak of any of them as being scarce in West Africa as a whole is like affirming that grains of sand are already scarce in the Sahara.

As an illustration of how successful the results of research have been in limiting the mortality in West Africa, I would mention that many people are of the opinion that there is little more to be done. Men who had commercial interests in the tropics 25 to 30 years ago were compelled to take some action owing to the very fatal effects of West African diseases, which rendered the employment they offered entirely unattractive, at least to those of their employees who desired to prolong life. Medical research was called for with insistence, and there were in those days individuals interested in trade with West Africa who were prepared to expend large sums for the purpose of research and sanitation. These men have been succeeded by a generation which has never experienced a death-rate of 70 per 1000 and which sees no reason to be dissatisfied with a death-rate of somewhere about 7 per 1000.



Gangosa (*Rhinopharyngitis mutilans*), showing perforation of the hard palate in patient with yaws history.

Research has Outstripped Practice.

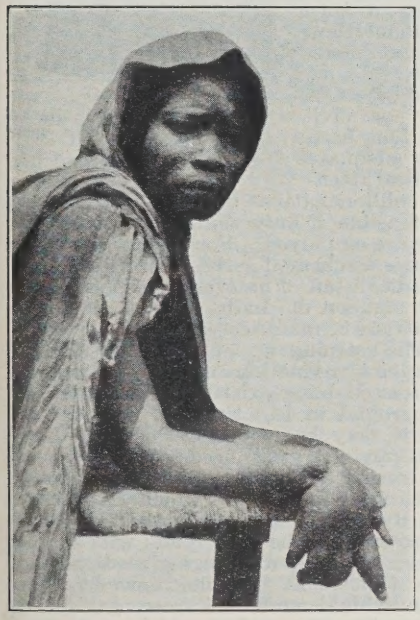
It is, I think, quite correct to say that research into the causation of disease has outstripped sanitation. A great deal of work is therefore being done at present by sanitarians which has the immediate aim of devising means of applying, in places like West Africa, the necessary and known remedies with the least possible expense. This question of expense is crucial; West Africa is no Panama; if we could act to-day in a manner quite regardless of expense, I have no hesitation in saying that we could deal with the health problems in West Africa as a whole in a way which would rapidly effect a complete transformation. But, unfortunately, we are faced with the insuperable obstacle of expense. The task before sanitary officers in the tropics now is to invent means of eradicating disease, not at a cost which the future result might easily justify, but at a cost which the present resources of the colonies permit. In the ultimate result I do not anticipate that much better figures than those recorded for non-native officials, and which I have given you to-day, can reasonably be expected; but what may be expected is that after a period of oscillation satisfactory figures will be maintained with much less effort than is required at present, on the part not only of the sanitary officers but also of every white individual, European or American, living in West Africa.

I should like to say a word with reference to certain diseases which in my opinion require further elucidation or prevention. Reverting for a moment to the figures quoted we find that of the 27 deaths recorded for 1928 among the non-native officials in West Africa, 20 were directly due to disease. Although many different diseases claim victims in West Africa, such diseases as yellow fever, alarming and fatal as they are, do not cause the steady and serious mortality that is produced by certain others which appear less conspicuous solely because they do not involve quarantine regulations. Of the 20 fatal cases referred to, death was ascribed to malaria directly in two, to malaria indirectly in one, to blackwater fever directly in four, and to blackwater fever indirectly in one. The total cases therefore in which either malaria or blackwater fever was the cause of death was eight—that is, 40 per cent. This is a figure which suggests that malaria, and even more so blackwater fever, require further study. Unfortunately, no investigation upon malignant tertian malaria in its association with

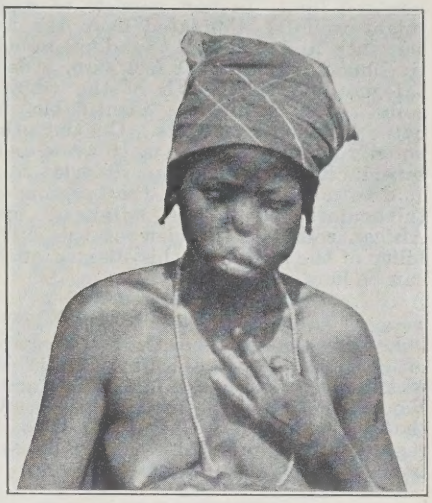
blackwater has ever been carried out on a scale commensurate with the importance of these two diseases to white residents in West Africa and elsewhere. It has been left to a few isolated individuals or small groups of workers to make such scanty observations as were possible or to formulate theories as to causation and prevention. It appears to me to be fully time to examine the theories already put forward, and if these prove inadequate to inaugurate a definite scheme of continuous research to discover the genesis of blackwater fever. Failing this, it would be best to act on the assumption that the causation of the disease is closely associated with malaria. Taking as probably correct, what many of us have long believed, that blackwater fever is a phenomenon dependent upon malignant tertian malaria or upon its sequelæ, one might expect substantial results from attacking the problem from the sanitation and personal prophylaxis point of view—that is, by concentrating on still further reducing the infection with malignant malaria, and by adequate treatment of the malaria cases which occur.

Segregation.

There are one or two other points which I should like to mention; for example, it may be well to spend a few moments in considering certain aspects of the white man's contacts with the native; apropos of this it will be natural to touch upon the subject of segregation and the domestic employment of natives. The subject of segregation has been the cause of much heart-burning and acrimonious discussion, yet it is difficult to understand why this should be so, as the principle underlying the whole question appears to be extremely simple. If a non-immune person has to live with an infected—e.g., a malaria-infected population, there are two ways open to him by which he can endeavour to avoid infection. The first is to place his quarters so far from that population's quarters that the infective anopheline mosquitoes are unlikely to reach and infect him; this is segregation. The second is either to treat and cure the disease in the infected population or to eliminate all mosquitoes or both; this is sanitation, and usually it is a much bigger proposition. Segregation is advisable and necessary wherever sanitation is impossible or imperfect. The segregation of a European from infective native quarters is no more a slight on the native than is the same European's practice of living in a mosquito-proof house in the midst of an infected population. The object and, with adequate care and a proportion of good luck, the result is the same in both cases—namely, the successful avoidance of the bites of the infective anophelines. But while segregation is no reflection on the native qua native and is a necessary and unavoidable proceeding in many instances, it is none the less an admission that preventive sanitary measures are either lacking or have failed, and in this sense it *is* a reflection upon our success in sanitation. The ill-results of non-segregation in infective populations with inadequate sanitation are exemplified in the experience of places like Dakar and yellow fever.



Case with gangosa, showing a nodular eruption on the face; deformity of hand; the right knee was also much enlarged; history of yaws.



Gangosa; cartilage of nose gone; ulceration of lip. Note shortening of left index finger from absorption of bone; the nail is still there.

While on the subject of segregation I might refer to the groups of Asiatics and particularly the Syrian. The Syrian in West Africa lives in conditions which are the very reverse of segregation, and as a consequence he constitutes somewhat of a problem from the medical point of view. In order that you may understand the position I may say that in the Protectorate of Sierra Leone, for example, one finds the Syrian small trader everywhere, usually esconced in the chief's compound and often in the house next to the chief. In many districts he is the self-constituted principal adviser of the chief, and he has incidentally collected into his own hands much of the trade of the various colonies, for example, the whole of the kola trade and much of the internal rice trade of Sierra Leone; this he has been able to do largely by a policy of non-segregation, by the process of living with and among the natives pretty much on their own level, a procedure attended doubtless by some financial advantage, but certainly by no gain in health. As a result of his lack of segregation the Syrian is constantly and severely attacked by many diseases acquired from the native. He is always getting malaria, blackwater, and other diseases; in fact, he performs the function of a sort of human indicator of the prevalence of various tropical diseases in endemic areas. There are doubtless excellent reasons of which I am unaware why he should be persona grata in British West African colonies, and it is possible that he may never attain there the dimensions of a political problem, but certainly from a health point of view his presence in British West Africa appears neither beneficial to us nor particularly fortunate for himself, and he does constitute a minor medical problem.

House Servants.

The case of house servants employed by white residents in West Africa may also be mentioned briefly. In Sierra Leone I have had the experience of engaging a cook who, on the day of his engagement, armed with the usual testimonials, was suffering from acute amœbic dysentery. Fortunately he was too ill to work and complained, and his condition was diagnosed, and he was sent to hospital. This illustrates a danger to the health of white residents in the tropics to which they should not be subjected, and which is largely avoidable. I have advocated the medical examination of cooks and house servants and their registration as a necessary means of protection for the health of their white employers. In

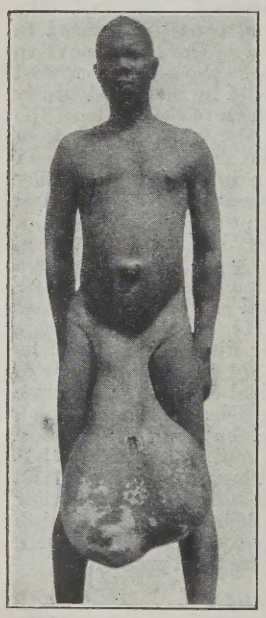
places where facilities exist a useful medical examination of servants could be easily carried out. Even if it were considered a hardship by a domestic servant that he should be refused employment because he is a carrier of amœbic dysentery, it would scarcely be regarded as other than a benefit by his prospective employers to be notified of the danger incurred if they engaged him. In fact carriers of diseases like this might well be eliminated from the ranks of house servants and advised to adopt another means of livelihood. There is, I feel sure, a definite need for safeguarding the health of the white residents by some such means as identifiable health certificates for house servants. On the other hand, it is equally incumbent upon us to avoid as far as possible introducing our European diseases to West Africa. It does not appear right that persons suffering from tuberculosis should be admitted into our West African colonies; in view of the extreme susceptibility of the native to this disease, such a procedure can be hardly justified.

The Health of the Natives.

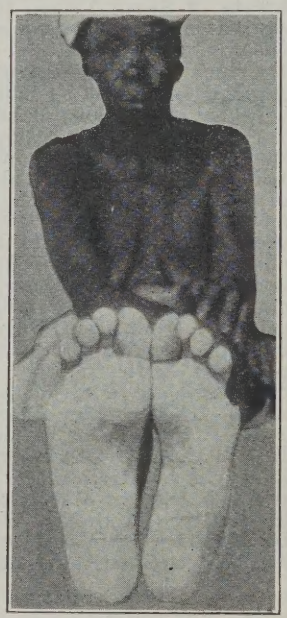
Let us now turn from the consideration of the case of the health of the white man in West Africa—which gives just cause for congratulation—to what I consider to-day the real problem of West Africa—that is, the health of the natives. The bush native is regarded by different observers from entirely different points of view according to individual interest.

A Reservoir of Peculiar Diseases.

Now the point of view from which the medical man engaged in research is compelled to see many of the West African natives at home in the bush unfortunately and necessarily leads to his concluding that the bush native in West Africa is a vast reservoir of peculiar diseases; that his average physique is poor and that his health is as a rule deplorable; that he is afflicted in immense numbers by appalling diseases and by deformities resulting from them. It may be said of him that considering his poor diet, his unfortunate personal habits, his environment, and his degree of infection with innumerable parasitic and other diseases, he is an outstanding marvel of racial adaptation and survival. But his partial immunity or tolerance of disease is acquired at the cost of great personal suffering. Of the rude health commonly attributed to the African natives I have heard much but seen little in the bush during ten years in West Africa. On the other hand, it must be admitted that he stands up to his difficult task of surviving his afflictions with a truly commendable fortitude. As van Loon says of primitive man, "A strange creature, surrounded on all sides by death and sickness, and yet happy and full of laughter."



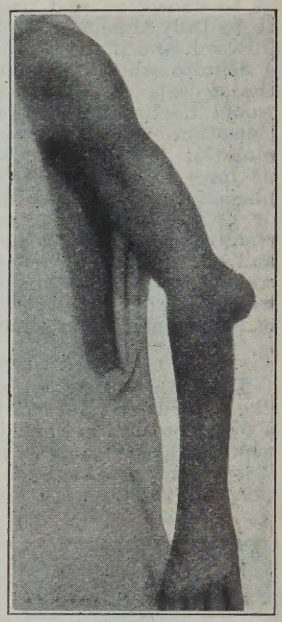
Elephantiasis of the scrotum and right inguinal hernia; leucodermatous patches on skin.



Ainhum, which has resulted in the loss of both little toes.

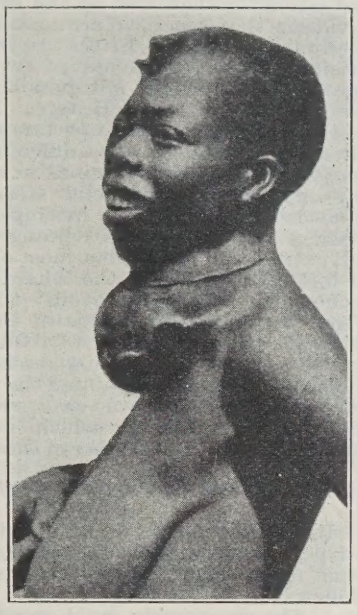
Provision of Medical Attention.

In the Sierra Leone Protectorate there are 1½ million inhabitants, the great majority of whom live in small villages remote from the railway and large roads and of whom only a small proportion are ever at any time of their lives within reasonable distance of skilled medical attention. The medical officers are in the proportion of 1 to 150,000 of the population, and they are necessarily stationed as a rule at the district headquarters or in military or civil centres. It has long been evident that any adequate provision of medical attention for the 25 million natives of our West African colonies is not feasible if only white or native fully qualified doctors are employed. For this reason there is now in existence a scheme for the establishment of a subordinate medical staff of natives corresponding to the subassistant surgeon of India, who, though not fully qualified, attain in many cases a high standard of efficiency. The opening up of the countries by road and the rapid introduction of motor transport is at the same time enabling existing medical officers to cover more ground in less time, so that in the course of years it may be expected that the more pressing medical and surgical needs of this great population will receive attention. This is an aspect of the results of road construction which His Excellency Sir Joseph Byrne, Governor of Sierra Leone, has kept in the foreground. The new roads will enable motor dispensaries to be used, bringing medical and surgical aid to thousands. While, however, the treatment of individual sufferers from particular diseases is an urgent matter and should be put upon a sound footing as soon as possible, the problem of the ultimate prevention of these diseases is equally urgent, and steps towards this are being undertaken now. The institution of clinics for child and maternal welfare, the inspection and treatment of schoolchildren in larger towns, venereal clinics, and the visiting of homes by trained native health visitors are all evidence of an earnest attempt on the part of the various Governments to bring about improvements in the general health of the native. In this connexion the work of the Royal Sanitary Institute deserves mention. In order to meet a growing demand this Institute has established a special course of tropical hygiene for sanitary inspectors in West Africa, the centres being each of the four West African colonies in rotation, so that each centre will have an examination every four years. Such institutions certainly benefit the town-dwellers, but what of the bush native? As regards the large mass of natives in remote areas, I personally have always been of the opinion that a very great deal could be



Subcutaneous nodule due to *Onchocerca volvulus* near elbow-joint.

done towards the prevention and eradication of disease by education of children and adults also, in simple rules of hygiene and particularly by actual demonstration of how various diseases may be prevented. I have urged that such education should be given in the vernacular and should consist largely of instruction in practical methods of eliminating dangerous mosquitoes, flies, ticks, and snails; teaching as to the dangers of insanitary methods of disposal of excreta and refuse and other obvious instruction. It is my firm conviction that a substantial amount of useful work in preventive medicine can be done by simple village natives who understand no language but their own; I hope to show you some photographs later which illustrate this. The diseases which retard the native, apart altogether from any contact he may have with white people will, for some generations, form an incentive to medical research and sanitary organisations, and will tax them to the utmost.



Goitre: a case from a large endemic area in the Kono district, Protectorate of Sierra Leone.

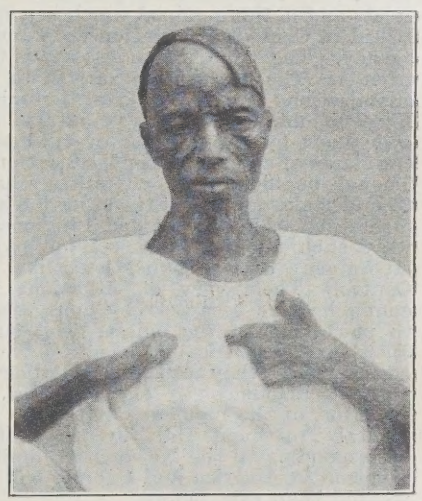
Readiness to Receive New Ideas.

The native of West Africa so far as I know him is a very amiable, law-abiding person, according to his lights, and in the opinion of many unprejudiced observers his lights are wonderfully good, although they may differ from ours in some particulars. Speaking of what I have seen in Sierra Leone, the opportunities which exist for advance in medical and sanitary work among the natives should not be disturbed owing to any general recalcitrance on principle on the part of the native himself. In fact it appears certain that in the eagerness of his pursuit of health the native of West Africa will be found second to none. Given a remedy capable of producing good effects in any particular disease, effects which are easily observable within a limited time, the natives will flock to you from great distances. I have had, like everyone else, amusing and embarrassing evidence of this when the natives have realised, after much initial reluctance in permitting the treatment, that diseases such as schistosomiasis and yaws could be rapidly ameliorated by injections; at once persons with entirely different diseases came forward asking for injections, and one had to explain that the injection fluid was not a panacea, a statement about which they were frankly incredulous.

A considerable stress is laid by many people upon the effects of native traditional customs on the reception by the natives of the ideas underlying modern sanitation and European treatment. It is rightly pointed out that one must be very careful not to interfere with the tribal customs and that traditional ideas must be respected or trouble will ensure. There is, so far as I can see, from a medical point of view, no necessity whatever to interfere unduly with tribal customs; detrimental customs will in time be given up by the natives themselves as soon as they become convinced that such customs are inimical to their health and well-being. As a matter of fact no native custom which is frankly brutal and apparently useless, however hallowed it may have been in the past by usage and tradition, is openly tolerated by the Government. Further, it would be difficult to imagine any more subversive change in native customs than the compulsion to pay house tax, yet this revolutionary interference with their traditions has been borne with considerable equanimity, simply because the majority have the common sense to perceive that it is advantageous to them. This same common sense will enable the native very quickly to take advantage of anything which medicine, surgery, and sanitation can do for him. There is, therefore, I believe, no need for those who wish to proceed with the work of ameliorating the health of the natives in the tropics to be deterred unnecessarily by fear of native customs.

A Survey of Disease in Sierra Leone.

I have referred to the future task of medical and sanitary workers in the tropics as colossal and I used the word advisedly. It will be my privilege merely to indicate to you the immensity of it in West Africa by reference to a survey of diseases in the Protectorate of Sierra Leone carried out by me at the request of the Government during my last two tours in West Africa. The survey was inaugurated by His Excellency Sir Ransford Slater, now Governor of the Gold Coast, with a view to obtaining some idea of the relative importance of the diseases which affect the native. During two tours I examined as thoroughly as possible samples of the population in all parts of the Protectorate. Over 10,000 natives were examined of both sexes and at all ages, every effort being made to examine all those who were not ill as well as those who were, in any particular village. In order of importance I placed foremost the following diseases: malaria, gonorrhœa, yaws. The two former, serious as they are, are regarded at present by the bush natives rather as natural accompaniments of life than as diseases. Yaws in the frambœsial stage is considered a necessary evil; its sequelæ, however, such as arthritis, bony deformities, and lesions of the feet are regarded seriously, and gangosa is much dreaded. Both forms of leprosy are of frequent occurrence and are feared, as is elephantiasis; subcutaneous nodules are numerous but are considered by the native as of no importance. Hernia and hydrocele and ulcers they complain of greatly, and these probably cause more serious invaliding than any other conditions. Goitre in certain districts is a serious endemic disease. Diseases of the eyes and ears are fairly frequent, and intestinal diseases such as dysentery and typhoid are also not uncommon. Urinary schistosomiasis is endemic in large areas, but only occasional cases of rectal schistosomiasis



Anæsthetic leprosy of many years' duration, the fingers (also toes) lost, self-cured; patient now alert and active.

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were found. In the following table are shown the numbers found to be affected with a few selected diseases in the Northern Province, part of the survey of the Protectorate of Sierra Leone.

Disease.	Total examined.	Total affected.
Arthritis	2900	143
Dermatitis	2228	1106
Elephantiasis	2904	49
Eye diseases	2194	134
Gangosa	2904	64
Diseases of glands	1953	743
Hernia; hydrocele	2194	408
Leprosy	2904	183
Subcutaneous nodules	2904	306
Ulcers; sinuses; scars	2194	708
Yaws; frambœsia	2904	719

The photographs here reproduced give an indication of the variety and serious nature of the diseases which may incapacitate the native of West Africa and prevent his leading a useful life. The figures given must also be taken into account in endeavouring to assess the total amount of personal suffering involved by such diseases.

IMPRESSIONS OF PSYCHIATRY IN AMERICA.*

By EDWARD MAPOTHER, M.D., F.R.C.P. Lond., F.R.C.S. Eng.,

MEDICAL SUPERINTENDENT, THE MAUDSLEY HOSPITAL.

In discussing psychiatry in America it is fundamental to appreciate that there is no Federal unity whatever in this matter; there is no less independence and no less difference of maturity between American than between European States. Psychiatric arrangements of all kinds represent 48 entirely separate arrangements. No general law exists and nothing official which is comparable to the Board of Control as a nation-wide and standardising agency. The same is true as regards the Province of Canada. The nearest approaches to any unifying organisations are the National Committees of Mental Hygiene financed from voluntary sources which endeavour by propaganda everywhere to raise the standards of care, treatment, education, and research. Though unofficial these committees have been asked to undertake surveys of the situation and the requirements in various States and Provinces, and in some ways such unofficial bodies if of good repute have advantages over organisations like the Board of Control. Their view of situations may be more comprehensive because they more readily get access to places out of the official orbit such as schools. Just because their statements have no necessary consequences they can express their real opinions without deference to the political and financial situation of the moment. After the passage of the Mental Treatment Bill, an organisation effectively corresponding to the National Committees of Mental Hygiene in America and Canada will be more badly wanted than ever before.

The purpose of my visit to America was not to see a truly representative sample in a critical spirit. I was admittedly out to see all that was best and most interesting—the "high spots" as they are called locally. Therefore any generalisations which I may venture apply only to what I saw, and for the most part to psychiatry in America at its best. Only in special connexions shall I refer to what seem backward arrangements. I shall make no criticism of American arrangements that is not really a quotation of expert opinion there. I want especially to emphasise features of American psychiatry that are topical. The Mental Treatment Bill seems likely to be this generation's contribution to progress or reaction, and it has now reached a fairly definite form. There are many points about American arrangements which throw a flood of light on the situation foreshadowed by the Bill, but I know of no evidence that American arrangements were considered before drafting it. In the parts of America that I visited I saw an amount of psychiatric research in progress that could not possibly be equalled in a similar tour of Great Britain. I do not profess to estimate the ultimate importance of anything I saw. Results that really make a difference are, of course, the product of a very few minds in each generation, but in opportunities for solid steady contribution to knowledge America is incomparably ahead. The view-points in research represent every school, and all extremes of course, but most of it is perfectly sane. I met one thinker of the "hard-boiled" materialist school who proposed to oust the term "emotion" from psychiatry in favour of the phrase "reaction through the diencephalon." On the other hand, a psycho-analyst conducting research on treatment of dementia præcox had painted the walls of his patients' rooms yellowish brown, as a substitute satisfaction for the anal erotism which was supposed to be fundamental. But neither of these was representative.

The Differences between American and British Psychiatry.

It appeared to me that the outstanding differences of psychiatry in America included four factors, and one main resultant. The four factors were as follows:—

1. The enormously rapid growth of population.
2. The extent to which official provisions at public expense are supplemented by bequests, donations, and above all from such sources as the Commonwealth Fund and the Rockefeller Foundation.
3. The degree in which the American psychiatrist is master in his own house—a degree which is unthinkable in our lawyer-ridden land.
4. The far wider diffusion and the much higher level of psychiatric education of all kinds in America.

The main resultant of these factors is the greater tendency in America to look upon the existence of mental disorder as a problem to be solved rather than a burden to be borne.

Rapid Growth of Population.—This means that institutional provisions for mental disorder tend always to be in arrears; the results are good, bad and doubtful. In general it may be said that the shortage reduces stereotypy. It affords frequent opportunity for embodiment of new thought by the addition of new institutions and of new features to old ones. It promotes a tendency to try legitimate substitutes for institutional treatment, and even to invest money in attempts at prevention and cure. Among the many excellent things that have largely resulted from institutional shortage are the extramural activities of the State hospitals and State schools. Clinics based on these institutions deal largely with cases of mental disorder and mental defect, who are able to stay at large under supervision, either after a period in a State hospital or without this preliminary.

Among the bad results of institutional shortage are:—

(*a*) Overcrowding almost everywhere.

(*b*) The need in places to treat some patients with transient and incipient psychosis in the city gaol.

(*c*) Discharge of patients in some places by lay and legal authority, in disregard of the medical superintendent's opinion, to make room for others.

(*d*) A tendency in places to reserve institutions for the worst and most antisocial cases of both mental disorder and mental deficiency.

(*e*) Delay in providing public hospitals for minor cases of both conditions. This is usually rationalised by a general claim to have discovered the fallacy of early treatment.

* A paper read at the Section of Psychiatry, Royal Society of Medicine, on April 8th.

In Massachusetts—the most progressive State—mental deficiency institutions are unclassified. Massachusetts is interesting, and at least logical, in that it justifies the mixed institutions for mental defectives by the very same arguments that in London are thought to justify mixed mental hospitals, but which do not prevent mental deficiency institutions here from being graded.

One of the doubtful tendencies due to institutional shortage is the very high proportion of cases of both mental deficiency and insanity which are on parole with friends—e.g., nearly 5000 out of the 45,000 insane for whom New York State is responsible at any given time. Doubts of the consequence of this probation from the eugenic standpoint, even when it is coupled with extramural supervision, are largely responsible for the legislation which in 12 States combines sterilisation with probation and supervision.

Donations.—Much is due to the enlightenment with which this generosity has been applied; the wise use of it is the ideal corrective for the politicians' tendency to think financially with reference to the next election rather than the next generation. In most places State provision has perhaps necessarily focused on the worst cases of mental disorder and mental defect. The Commonwealth Fund and the Rockefeller Foundation, collaborating largely with the National Committees of Mental Hygiene of America and of Canada, have concentrated on a triple programme.

1. Upon promotion of the advanced training of psychiatrists and of research by the grant of fellowships at centres like the Phipps Psychiatric Clinic and at the Boston Psychopathic Hospital.

2. Upon a programme of propaganda and of prophylaxis and early treatment of minor divergences through out-patient clinics. One of the most striking movements is the provision of mental hygiene facilities at the universities as part of the health service which is a recognised provision for undergraduates.

3. Upon the Child Guidance movement which owes its growth, though not its birth, to private generosity. There can really be no doubt about its influence in reducing unhappiness during childhood, and in averting the anomalies of character that are continuous with definite neurosis and with criminality.

The Foundations in America have always observed the wise principle that the rôle of private endowment is to give a start to promising novelties and to insist that when a given service has proved its case as a need of the community, then the time has come for the community to provide that service and to finance it locally whether by taxation or by voluntary contributions. It may be rank heresy, but the policy of the American Foundations leaves me wondering whether progress might not be faster in this country if private generosity could be directed more to new ventures and less to established institutions (such as voluntary hospitals without medical schools to justify them). These would inevitably exist as a public service if not privately supported. Despite all that psychiatry owes to philanthropy in America, I want to stress the fact that our national shortage of millionaires is not a complete excuse for the gap between the best State systems in America and the best in England. Anyone who doubts the gap should make a careful study of the whole system under the Department of Mental Diseases for the State of Massachusetts—including its provision for research. This system owes comparatively little to private benefactions. The Institute of Juvenile Research in Chicago is also a splendid organisation for child psychiatry, supported wholly by the State of Illinois.

The Emancipation of the Psychiatrist.—This replacement of the static mind of the lawyer by expert knowledge, and the experimental spirit in control, is the great guarantee of the future in America. This transfer of control is most complete in the most highly organised and most progressive States, such as Massachussets and New York, and all tendency to question it—even by lawyers—seems to be over. Before detailing how the psychiatrist in America has secured the management of what are indisputably his own affairs—i.e., arrangements for the neurotic and psychotic—I may just refer to the way in which he is there getting a voice in dealing with another form of mental disorder—viz., criminality. In Detroit there is attached to the Recorder's Court (handling nearly 10,000 felonies and 30,000 miscellaneous a year) a complete psychopathic clinic with two psychiatrists and a group of social workers and psychologists. To this clinic about 1000 cases per annum are referred—felonies and misdemeanours in about the ratio of their occurrence. The reference may be:—

(*a*) Before trial—for opinion as to responsibility.

(*b*) After verdict and before sentence, as to whether this should be, on the one hand, commitment to prison or reformatory and for how long, or, on the other probation with supervision.

(*c*) For guidance as to problems arising while on probation.

The court follows the clinic's recommendation in nearly 90 per cent. of reference cases. When there is any difference the court almost always takes a less severe course than that recommended by the psychiatrist. This is a good answer to the view that asking the alienist means coddling the criminal. Ninety per cent. of cases in which probation is advised by the psychiatrist keep straight. The general usefulness of such reference is shown by the fact that even offences in connexion with driving motor-cars are found to have a correlation with mental disorder; I rejoice to say they are not pathognomonic. Similar arrangements exist at Cleveland, Ohio. Here the psychiatrist was not a whole-time officer of the court when I visited, but his appointment was being considered, since so large a proportion of all cases coming before the court were referred to him. In the two most advanced States of America, the Commissioner at the head of the department of correction is a psychiatrist. This department is responsible under the Governor for all penal arrangements, as is the Home Office in England. In the State of Maryland the Commissioner for Mental Diseases has authority to transfer any person from prison to a mental hospital, which constitutes an absolute power to adjust any punishment except that of death. Nobody seems inclined t question these arrangements.

Arrangements for Prevention and Care of Neuroses and Psychoses.

The arrangements for the future in England which will follow the Mental Treatment Bill are as follows: Hitherto the medical element of the Board of Control has been equal to the legal and lay. Hereafter it is only secure that one of the "Big Five," who are to settle all policy, shall be a doctor. A proposal that he should necessarily be a psychiatrist was negatived by the Select Committee of the House of Commons. The position of the only other doctors connected with this new Board of Control was neatly summarised by the statement that they were to be the servants or alternatively the hands and eyes of the "Big Five"—who presumably will combine the functions of brain and mouth. With this may be compared the position in the most advanced States of America—Massachusetts and New York. Here all psychiatric provision and supervision by the State is entirely in the hands of a State Department. There is no triplication of function, as hitherto, between Board of Control, county council, and guardians, nor even duplication, as now, between Local Authority and Board of Control. There is a simplification which may be roughly compared to what would exist if all public provisions for psychiatry had to the Board of Control the relation which Rampton now has. In other words, the State Department is responsible for everything in respect of public institutions, and is responsible for all rules, supervision and management, obtaining from the

legislature the necessary funds for provision and for maintenance. In private institutions it is responsible for rules and supervision. Over this Department for Mental Diseases is a permanent head—the Commissioner—with powers far exceeding in every way those of the Board of Control, having direct access to the Governor of the State without intervention of any Minister or other layman, lawyer, or politician, and through the Governor, access to the legislature. It is definitely laid down by law that the Commissioner shall be not only a doctor but a psychiatrist, with at least five years' institutional experience. Though nominally his tenure may cease with that of government by one party, in practice it is permanent. The progressive States of America have done with making political appointments to such posts, and with attempts to influence the policy of psychiatrists by political considerations. Such States have also discarded the system whereby the senior civil servant desiring such promotion is thought fit to direct the activities of the State in respect of psychiatry when a vacancy occurs, regardless of previous knowledge or experience of the subject. On the best authority I understand that in practice the Governor and the Legislature in progressive American States consider that their province is limited to deciding how much can be appropriated for new projects of the department, and whether the general financial situation permits of finding the money needed for the proposals advocated by the Commissioner of Mental Diseases. Apparently detail is left to him entirely, and even the order of priority of his proposals. With this may be compared, by those with time to spare, the official reports of the discussion upon the Mental Treatment Bill. America has apparently lost our English faith in settlement of technical detail by the inexpert. Within the Department of Mental Diseases in Massachusetts, there is no lawyer, except one concerned in recovery of contributions due from relatives of patients. There is no layman, except the woman at the head of the Social Service Division. The Assistant Commissioners or the heads of all other divisions are psychiatrists.

Of these the Commissioner is chief, with almost autocratic powers in reserve. His immediate subordinates—each in charge of a division of the department—are what we should call in England deputy medical superintendents, seconded to headquarters. On occurrence of a vacancy as medical superintendent, one of the assistant Commissioners goes back to run the mental hospital, and another deputy superintendent comes up to headquarters. Every month in Boston a dinner is held (subject to the 18th Amendment), and attended by all the superintendents and all the assistant Commissioners, with the Commissioner in the chair. At this, free discussion of official matters is encouraged. The whole scheme seems ideally adapted to reduce to a minimum the gap between regulations and reason constituting the headquarters spirit with which so many of us first became familiar in the war.

Commitment Law.

This varies in different States from the extreme of legalism to the fully medical conception. In certain States it is still, or recently was, indispensable that the alleged insane person should be tried in open court before a judge and jury, and should plead guilty or not guilty to the charge of insanity. Slight modifications of this are common. It is also common that upon a writ of habeas corpus an already certified person has to be produced in court for the question of his insanity to be settled by a jury, who may disregard the medical superintendent's opinion. This is the situation in Washington, the American home of the politician and the lawyer.

When I was there a lawyer had just been shot by a lunatic whose discharge he had obtained a year before through such a writ of habeas corpus, in spite of the fact that the man had been certified after a previous homicide, and despite the fact that Dr. White, of St. Elizabeth's Hospital, had opposed the discharge. The effect of this piece of poetic justice had not yet become evident.

On the other hand advanced medical opinion in America is moving steadily in favour of total abolition of the judicial authority in commitment procedure. It is reasonably pointed out that there is no more reason to anticipate ignorance, bad faith, or lack of reasonable care in the case of a doctor than of a magistrate, and that if, of two certificates required, one must be given by an expert and approved psychiatrist, then the patient's interests are far more adequately protected than by any magistrate. In Maryland complete dispensation with the judicial order is an established fact. A patient can be committed for permanent (not mere temporary) detention on the certificate of two medical practitioners. It is not even provided, I believe, that either should be expert and approved. But there is an onus on the Commissioner to see the patient either at an ordinary or special visit. The system works perfectly well. Abuse would involve ignorance, neglect, or conspiracy of the two certifying doctors, the superintendent and the Commissioner, and naturally does not occur. Further, the system works well from the doctor's standpoint. As a rule in Maryland the same situation exists as in England with private cases. Even though still insane, patients are usually discharged upon application of relatives who will vouch for care and control—except in rare instances of clear suicidal or homicidal propensity. Actions for illegal commitment are no commoner than elsewhere and practically never successful.

Psychiatric Education.

The education of the public has reached a point where the man and woman in the street know about the existence of mental hygiene services and are prepared to utilise these for their children and even for themselves. One of the most interesting educational projects in America—a counterblast to excessive specialism—is the foundation of the Institute of Human Relations at Yale. Here it is intended that, as the preliminary of their professional training, the future doctor, lawyer, clergyman, and others, whose business is the handling of people, shall get a common grounding in at least the elements of biology, physiology, and psychology, including among the practical derivatives of psychology, sociology and some psychiatry. It is intended to make of this psychobiology an essential common ground-work, almost as we build on a foundation of dead languages.

As to pregraduate medical education in psychiatry there is no university or medical school in this country which approaches in thoroughness that which is universal in at least ten American universities. Comprehensive courses are given in each of four years of medical training—a real grounding in medical psychology and psychopathology. The students are taught clinical psychiatry by lectures and demonstrations, and personal study of patients by allocation of definite cases of neurosis and psychosis, but above all by direction of attention to the psychiatric aspect of those illnesses seen in the ordinary wards and clinics. In Columbia as much time is devoted to the study of psychiatry as to each of the other major subjects—medicine, surgery, and gynæcology. Since quite similar situations exist in Germany and Holland and generally in progressive European countries, it seems doubtful whether the thinly veiled pride which the run of English practitioners take in their ignorance of psychiatry is really referable to our genius for practicality. There has hitherto been no diploma in psychological medicine in America, but I know that Prof. Adolf Meyer is interested in the institution of one—possibly of one in each State with equal standards.

For acquisition of technique from those actively engaged in various branches of research, and for really advanced teaching, American psychiatrists have of late years mainly gone to Vienna—except in respect of neurology, for which all say that the

National Hospital, Queen-square, is the best centre in Europe. In view of the staffing and facilities which will be available in the three psychiatric institutes which are to open shortly—those in New York connected with Columbia and Cornell Universities and that at Philadelphia, the current may well flow the other way soon.

In America, most of the ideals held up by the Committee appointed by the Board of Control on the training of mental nurses are realities. The State of New York is enforcing as a preliminary requisite of nursing a high school education until 18. The inclusion of general training in the mental nurse's course and, conversely, the mental training of both pre-graduate and post-graduate general nurses are commonplace.

My impression of the general differences representing the resultant of the four factors which I have emphasised was as follows: As to psychiatry, America is interested chiefly in development, England in maintenance. American attention is fixed mainly on what will be and English on what has been. American arrangements often seem unfinished, like everything that is growing, occasionally crude enough to offer scope to the scoffer. But efforts limited to maintaining the standards of the past in psychiatry, as in everything, are apt to fail, and fixation to be followed by regression. In actual structure and maintenance of those types of public institutions which exist in England and of amenities for patients, I doubt whether America has much that clearly outstrips the best in England. The most striking places that I saw were Bloomingdale, near New York—what we should call a registered hospital—and a hospital at Northampton, Massachusetts, run by the Veteran's Bureau (or Ministry of Pensions). Comparing the general maintenance cost of institutions in the States of New York or of Massachusetts with the cost in London, there is little evidence of better maintenance in America. Nor could I find that the public attitude to in-patient treatment there was different.

Voluntary Patients.

Owing to the wide extramural activities of American State Hospitals, these are much less suspected than their equivalents in England. But though provision for treatment of voluntary patients in the State hospitals of Massachusetts and New York has existed for many years, the public response is negligible.

In Massachusetts there are practically no voluntary boarders. In New York, of 45,000 State-aided patients, 652 were voluntary. In New York hospitals in 1927 there were 11,500 admissions. Of these, 5 per cent. were voluntary. Of this 5 per cent., one-half were recurrent; of the other half, the great majority would otherwise have been there under certificate, while most of the minority belonged to the hoboe class. This is an illuminating commentary on the Mental Treatment Bill, Clauses 1 to 4, especially when coupled with reassurances given by the Minister of Health to anxious representatives of local authorities that no new expenditure or new building need be feared—that what is intended is treatment of the same types in the same buildings by the same staff with different formalities.

It has been said that if private patients in large numbers will voluntarily enter such an institution as the Retreat, where some other patients are certified, then the poorer classes will resort to the county mental hospitals as voluntary patients when this is permitted. American experience shows this to be an utterly false analogy. Such institutions as Bloomingdale have 70 per cent. of voluntary admissions nowadays, but the State hospitals have practically none in any real sense. In fact, owing to widespread possession of means enough to pay for a time the cost of treatment outside a State hospital, these American registered hospitals are rapidly becoming the places where all but the very poor are treated for incipient and transient psychoses. The actual position is that public provision for the voluntary case by the State is as yet almost as defective in America as in England. The only wholly voluntary institution, comparable to the Maudsley, is the Phipps Psychiatric Clinic. This is splendid, but it is neither State-supported nor does it provide in any considerable measure for the poor. Both these remarks apply equally, I believe, to the forthcoming Psychiatric Clinic at Philadelphia and that connected with Cornell University, New York. The other, connected with Columbia University and located in the medical centre of New York, may be more analogous to the Maudsley. The out-patient departments of the Phipps, the Boston Psychopathic, and Cornell Clinic, New York, were the most striking. The latter is run in a general hospital like various such departments in London, but on a paying basis more like that of the Tavistock Clinic, and is well organised and flourishing.

Hospitals undertaking initial observation and treatment of psychosis under temporary treatment orders are usually managed by the city authorities, whilst hospitals for more prolonged care are maintained by the State. The Boston Psychopathic Hospital, closely connected with Harvard University by the State of Massachusetts, is exceptional in this as in all else. But splendid as it is, and negligible as are the formalities attending commitment there, there were only 58 voluntary admissions out of 1906 in 1928. This suggests how little importance the public will attach to any difference about admission under Clause 5 of the Mental Treatment Bill. The reduction of formalities is far greater in regard to admission to Boston Psychopathic than under Clause 5.

The City Psychopathic Hospitals in many cases have university connexions and useful functions in teaching. From the standpoint of the patient I gathered that their repute was not high. Of the Belle-vue in New York it is fairer not to speak, since it has been decided to abandon and replace the psychiatric part of this. Others that I saw seem better than most London observation wards, but far from ideal. They were mostly constructed of glass, metal, tiles, and concrete in what has been called the neo-lavatorial style of architecture. The ease with which they can be washed down with a hose doubtless admirably adapts them to their special purpose, but it is difficult to reconcile with a home-like atmosphere.

It is not better buildings or maintenance that constitute the real difference of American psychiatry. The difference depends upon the medical spirit dominating it, and consequent pre-occupation with treatment and research. An outstanding feature of all American institutions is the number of doctors St. Elizabeth's Hospital, Washington, with over 4000 patients, has 40 doctors, and Dr. White reckons that the right proportion is one doctor per 100 patients. Elsewhere the proportion accepted is one per 150 with a special allowance in proportion to admissions. This ratio would just double the number of medical officers in all London hospitals. In reality the amount of medical work which is possible is much greater owing to reduction of clerical work by the use of dictaphones and stenographers. Scientific work is encouraged by establishment, just below the superintendency, of three equal positions—that of administrative assistant, clinical director, and pathologist—each providing a satisfactory career. The medical superintendents of most of the notable State hospitals have teaching positions, and all the junior staff are stimulated—not forbidden—to form connexions with other hospitals outside. In spite of this, in America, as in England, there is difficulty in getting doctors of the best quality to enter psychiatry. This exists even in the schools where teaching is best; staff vacancies are not readily filled from the universities with which the psychiatric clinics are connected, and candidates have to be sought outside. To some extent the difficulty is declining as the repute of psychiatry grows. But one difficulty which remains is creditable to the moderation of the medical profession in view of its

control of the situation. Though the numbers of medical officers are high, salaries are low; they seemed on the average to be little higher than in England. Considering the general scale of American incomes, I think this clearly means a relatively lower financial status. It is a pity if this should prevent advantage being taken of the splendid opportunities which exist.

Judged by the standard of recent achievement, psychiatry in America is probably, on the whole, the equal of that in any country of the world, but it is very uneven in all respects. Hardly anywhere is everything all that one might fancy, but somewhere every improvement that we are merely talking about is in working order, serving as the little leaven that leaveneth the whole mass. America, like every country, has its cranks, but the people who are directing the development of its psychiatry are not that. They have the national readiness to try anything once, but to me they seem to be neither credulous nor given to making claims. In fact they seemed full of the "enthusiasm without illusions" that is the true scientific spirit. I have had glimpses of the psychiatry of ten European countries. I think the future is more secure in America than in any other country because it is rooted in the four factors of which I spoke. Lastly, in view of the respective estimates of British and American psychiatry prevalent outside the two countries, there is little room for that complacent tolerance towards the enthusiasms and efforts of others which is apt to pass for humorous wisdom in England, and seems so maddening to all the other nations of the earth. Those who can may hope that the leadership which has produced the Mental Treatment Bill as it is will somehow secure the expensive supplementary arrangements which alone will make it more than a change in formalities. Others may hope that, if an opportunity for real progress is given to the next generation, it may be based on knowledge of arrangements actually working elsewhere, rather than on lawyers' bogeys subtly evolved from the inner consciousness.

THE RELATION OF ACETO-ACETIC ACID TO DIABETIC COMA,

AND THE CAUSE OF DEATH.

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THIS communication is concerned mainly with two aspects of diabetic coma: firstly, the factors leading to the establishment of the condition; and secondly, those responsible for death in coma.

Cause of Diabetic Coma.—Amongst the views expressed by various writers on this subject, those ascribing the condition to ketosis or acidosis occupy by far the most important position. Supporters of the acidosis theory maintain that coma is due to the production of acids following the faulty metabolism of fats, and that the accumulation of such acids in the blood leads to a depletion of the alkali reserve. This value sinks from a normal of some 52–75 c.cm. CO_2 per cent. to 20 c.cm. or lower in the majority of patients with diabetic coma, and the relative constancy of this finding has led many observers to regard a depleted alkali reserve and diabetic coma as being causally related. Whilst it is well known that acidosis will produce an increase in the depth of respiration, it is equally well realised that acidosis occurring in non-diabetic conditions such as prolonged vomiting and the terminal stages of nephritis, will not produce the symptom-complex of diabetic coma. The frequently recorded observation that diabetic coma can occur with either a normal or only slightly depleted alkali reserve, forms another argument against the acidosis theory.

The ketosis theory ascribes the onset of coma to the increasing accumulation of ketone bodies, such as aceto-acetic acid and β-hydroxybutyric acid, in the circulation. The evidence in favour of this theory is two-fold: firstly, the concentration of acetone bodies in the blood greatly increases in comatose and pre-comatose conditions; secondly, the careful animal experiments of Hurtley and Trevan[1] showed that if aceto-acetic ester is injected intravenously into cats the amplitude and frequency of respiration is greatly increased. As a result of these observations these workers suggested that the onset of coma could be explained by the increase of aceto-acetic acid in the blood. They attributed the symptoms to the presence of the enol group in aceto-acetic acid and showed that other substances containing this group also produced an increase in the rate and amplitude of respiration. The only determinations of aceto-acetic acid in the blood found in the literature are those of Marriott,[2] Geelmuyden,[3 4] and Kennaway.[5] The latter investigated blood from diabetic patients which, with one exception, had been obtained at autopsy. He supported the view propounded by Hurtley and Trevan. It is interesting to note that his observations record concentrations very much higher than those about to be described. Kennaway also suggested that a continuous series of investigations on patients during and after coma would be necessary before the theory could be accepted in its entirety, and we have followed out this suggestion.

Since no answer has been given to these problems it was thought that an investigation of diabetic coma from the point of view of the variation in both the aceto-acetic acid content of the blood and in the alkali reserve would be of interest.

Observations on Patients.—The following account is based on a study of seven cases. Of these, four were in definite diabetic coma and showed the classical symptoms of unconsciousness with Kussmaul respiration, subnormal temperature, and reduced intra-ocular tension. Two cases were in a pre-comatose state and were severe diabetics who developed gastro-intestinal symptoms, subnormal temperatures, and weakness. They were sufficiently well to walk to hospital, and being experienced diabetics realised that their condition was urgent. The seventh patient was suffering from inoperable carcinoma of the breast with secondary deposits. Severe diabetes was also present, requiring at least 50 units of insulin a day for the control of a very restricted diet. In view of the terminal nature of the malignant disease it was decided to impose no dietetic restrictions or treatment with insulin. This series of cases presented two aspects of diabetes; the first six were severe cases in whom every attempt was made to control the condition, whilst in the seventh case, also a severe diabetic, no such attempt was feasible.

Methods of Investigation.—The alkali reserve of the blood was estimated by the method of Van Slyke,[6] great care being taken to ensure uniformity in the determinations. Thus, saturation of the specimen with CO_2 was performed by a gas mixture containing 5·5 per cent. CO_2 in air in a cylinder. The acetone bodies in the blood were estimated by the method of Behre and Benedict[7] in the form of volatile and non-volatile acetone bodies. Since the blood contains little or no acetone[8] these estimations correspond respectively to aceto-acetic acid and β-hydroxybutyric acid.

Results: Ketosis.—In Table I. will be found a record of the aceto-acetic and β-hydroxybutyric acids in the blood of the seven cases referred to above. The observations quoted were the highest figures found during the course of the condition. It will be remembered that Case 7 was the patient

with inoperable malignant disease. Despite the fact that insulin administration was discontinued this patient did not go into coma. The diet was liberal and the patient was allowed to eat fats freely. The blood-sugar rose to 500 mg. per 100 c.cm. and the urinary output of sugar reached 11·7 mg. per 100 c.cm., whilst the daily excretion of urine varied from 2000 to 2900 c.cm. This patient showed no symptoms of coma, the alkali reserve averaged 65 c.cm. CO_2 per cent., and on the day before death was 63 c.cm.

TABLE I.

Case.	Condition.	Aceto-acetic acid.	β-hydroxybutyric acid.
		mg. per 100 c.cm.	
1	Coma.	27·0	78·8
2	,,	24·5	44·4
3	,,	43·5	64·5
4	,,	25·0	40·0
5	Pre-comatose.	11·5	93·0
6	,,	40·5	34·3
7	Non-comatose.	35·3	133·0

An inspection of the table reveals the interesting fact that the amount of aceto-acetic acid in the blood bears no relationship to the clinical state. Thus, one of the patients in the pre-comatose group possessed a higher concentration of aceto-acetic acid than three of the patients in the comatose group, whilst the seventh patient had a higher figure than three of the patients in coma. It is admitted by most workers that β-hydroxybutyric acid bears no relationship to the ætiology of coma, and the results in the table bear out this view.

TABLE II.

Case.	Alkali reserve: c.cm. CO_2 per cent.	Case.	Alkali reserve: c.cm. CO_2 per cent.
1	8	8	42
2	13	9	40
3	24	10	36
4	14	11	29

Acidosis.—Turning now to the acidosis theory, observations on four of the above patients together with four from a different series of cases of diabetic coma are recorded, and in Table II. will be found the lowest alkali reserve content of the blood. It will be seen that the figures are very variable indeed, ranging from 8 to 42 c.cm. These observations confirm the fact that there is no constant relationship between reduction of the alkali reserve and diabetic coma.

In cases of non-diabetic acidosis, such as that occurring in uræmia, or persistent vomiting, the alkali reserve may be reduced to as low a figure as 12 c.cm., as happened in a patient examined by us, without the patient losing consciousness. To conclude, therefore, a patient may be in diabetic coma with either a high or a low alkali reserve, and, alternatively, a non-diabetic patient may have a very low alkali reserve and still be conscious.

TABLE III. (Case 3).

Date in 1929.	Time.	Aceto-acetic acid.	β-hydroxy-butyric acid.	Alkali reserve: c.cm. CO_2 %.
		mg. per 100 c.cm.		
28/12.	9.0 a.m.	43·5	40·0	24
	12.30 p.m.	43·5	64·5	24·5
	3.0 p.m.	41·7	64·5	32·5
	6.0 p.m.	18·2	17·7	47
	10.0 p.m.	10·9	5.0	53
29/12.	2.0 a.m.	2·4	25·0	53

2.30 a.m. death.

In order to follow the course of events in diabetic coma, blood analyses were performed at three-hourly intervals until recovery or death took place. In Table III. are recorded the variations in the acetone bodies and alkali reserve in a fatal case of diabetic coma.

It will be seen that the aceto-acetic acid content of the blood fell steadily until the fatal termination. The alkali reserve rose, and it would appear that neither of these values bears any relationship to the cause of death. It is also interesting to note that this patient only received half a drachm of sodium bicarbonate and yet the alkali reserve rose steadily until death supervened. A post-mortem examination failed to reveal any complications.

Closely parallel figures to those in this table are found in Table IV., the analyses in this case being performed on a patient who recovered. These observations seem to show that neither the acidosis nor ketosis theory adequately explains the cause of diabetic coma.

In addition to the fact that the concentration of aceto-acetic acid in this patient's blood when in fully established coma was considerably below that of our non-comatose patients, it increased after the patient recovered consciousness. This unexpected observation was confirmed in subsequent cases, and therefore provides another argument against the enol theory.

TABLE IV.

Date in 1930.	Time.	Aceto-acetic acid.	β-hydroxy-butyric acid.	Alkali reserve: c.cm. CO_2 %.
		mg. per 100 c.cm.		
22/3.	10.45 a.m.	25	40	14
	12 noon.	Recovered consciousness.		
	3.0 p.m.	40	35	47
	10.30 p.m.	26·3	21·6	68
23/3.	10.30 a.m.	33·3	30	55
24/3.	10.30 a.m.	20	30·8	51

The Cause of Death in Diabetic Coma.

Three possible causes of death in cases of uncomplicated diabetic coma may be put forward: (1) advancing coma—i.e., acidosis or ketosis according to the theory supported; (2) nitrogen retention; (3) circulatory failure.

In the previous pages it has been shown that even with appropriate treatment causing reduction of the blood-sugar and a concomitant rise in the alkali reserve the patient may still die. Nitrogen retention occurs in some cases of diabetic coma but appears to bear little relationship to the question of death or recovery. Cases of combined uræmic and diabetic coma are, of course, excepted from this series. The last theory—namely, that of circulatory failure—must be adopted if only by a process of elimination. It has received considerable support from such writers as Joslin, and more recently Graham[9] and one of us (E. C. D.).[10] A constant finding in fatal cases described by previous writers and also observed in this institution is a persistently falling blood pressure. In the last three cases the blood pressure was unobtainable at the brachial artery, and was certainly below 60 mm. Hg systolic. Another invariable symptom is collapse of the veins, making it exceedingly difficult to obtain blood by the usual routes. Some workers (Graham, Kennedy) have described alterations in the appearance of the blood removed from such patients and have remarked on the difficulty of obtaining it by a syringe. They describe it as being sticky. This phenomenon has been attributed to the concentration of the blood and is associated frequently with a raised hæmoglobin content. In order to investigate this problem, the variations in the hæmoglobin and total solids content of the blood were studied. As this proved more elaborate than was originally expected it will form the subject of a future communication, and it will here suffice to refer to the findings very briefly.

Observations on a series of patients in diabetic coma showed that the hæmoglobin content as estimated by Newcomer's method did not rise above the normal figure of about 15 g. per 100 c.cm., whilst the total solids

yielded similar results—i.e., they did not rise above the highest normal figure of 23 g. per 100 g. of blood. If the patient recovered from coma it was found that the hæmoglobin content fell rapidly, as also did the total solids. It appears, therefore, that although there is little evidence in this recent series of concentration, yet there is definite evidence of dilution following recovery. In support of this it was also observed that the veins became fuller when the patient recovered, and one in whom there were no veins palpable or visible at the elbow, and from whom the blood had to be collected by arterial puncture when in coma, developed normal and full veins on recovering consciousness.

Many observers (Bock, Field, and Adair,[11] Rosenbloom,[12] McCaskey,[13] Starr and Fitz[14]) have recorded the death of patients in coma with no acetone bodies in the urine. This has led them to postulate the production of an unknown acid body. It would appear that the phenomenon might be explained on the line of circulatory failure, since in Case 3 treatment had reduced the acetone bodies to within normal limits and had raised the alkali reserve, yet death supervened from circulatory failure.

With regard to the alteration in the composition of the blood in coma, it is perhaps permissible to digress from the chemical aspect and mention the leucocytosis which always occurs in diabetic coma. This is not described in the majority of text-books and in our experience is very little known. It is described by Allen[15] and Joslin.[16] In all cases examined by us there was a definite leucocytosis with over 20,000 white cells per c.mm. It seems, therefore, that this should be borne in mind in the differential diagnosis of any condition giving rise to leucocytosis.

Summary.

1. A study of (*a*) the aceto-acetic acid and (*b*) the alkali reserve content of the blood in patients in diabetic coma failed to support the theories of ketosis and acidosis respectively as a cause of this condition. Thus, in many cases non-comatose diabetic patients were found to have a higher aceto-acetic acid content than the comatose patients, and it was found impossible to correlate the blood analyses with the clinical condition of the patient.

2. On recovery from coma it was found that the aceto-acetic acid content rose, thereby further indicating that the enol theory of diabetic coma is improbable.

3. In the fatal cases it was found that death was preceded by a persistently falling blood pressure, and the importance of circulatory failure is indicated.

4. The occurrence of leucocytosis in coma is confirmed.

We have to thank Dr. G. E. Beaumont, Dr. G. E. S. Ward, and Dr. D. E. Bedford for giving us permission to examine their patients.

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DONCASTER ISOLATION HOSPITAL.—The Doncaster Corporation's new Isolation Hospital, on the edge of the borough, which has cost £53,000, was opened recently. There are five blocks of wards and a sanatorium with accommodation for 98 patients, an administrative block, and a home for the resident medical officer.

SPINAL CORD TUMOURS.

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IN THE LANCET of Feb. 4th, 1928, we recorded six cases of tumours of the spinal cord which had been under our care within one year. The present communication deals with points of special interest presented by three additional cases. Two were women, aged 42 (Case 1) and 24 (Case 3) respectively, and one a man, aged 32 (Case 2). There was no occupational incidence, nor was there a history of injury preceding the onset of symptoms in any of the cases. In Cases 1 and 2 the tumour was situated in the thoracic region of the cord, in Case 3 in the cervical region. This last case was of special interest because a swelling had appeared in the side of the neck about six months before spinal symptoms became manifest and led us to make a tentative diagnosis of a "dumb-bell tumour"—i.e., a tumour having one part outside and another part inside the spinal canal, the parts being joined by an isthmus passing through an intervertebral foramen. This diagnosis proved ultimately to be correct.

A feeling of coldness or numbness was one of the earliest symptoms in each of the cases. In the cervical case this symptom was first referred to the right hand, in the other two cases (thoracic) it was referred to one or both lower limbs. One thoracic case had, in addition, a tingling sensation in both feet as an early symptom, and the other had a sense of constriction in the lower part of one thigh. The cervical case developed "tingling" in both hands about four months after the onset of the numb feeling. In this case, also, loss of power in the right hand and arm quickly followed the initial feelings of numbness, and within four months the patient was quite unable to use this limb. In the two thoracic cases slight stiffness developed in one leg, associated with some dragging of the foot, three months after the initial symptoms in one case, and six months after in the other. All three cases had suffered from a "girdle" sensation at some period in their course but not at the beginning. This sensation was not one of pain but rather of constriction—like a "tight band" around the body. Only one (Case 1) exhibited root pains and these were not constant and only appeared late—about ten months after the onset of other symptoms. No tenderness over any of the vertebræ was made out and no abnormality of the spine was found.

The spinal level diagnosis was arrived at from a careful study of the physical signs, but in all cases confirmation was sought, prior to operation, by lipiodol injection into the spinal subarachnoid space by puncture of the cisterna magna as described in our previous paper. Before the lipiodol injection the spine was X rayed to exclude any lesion of the column. After the injection the spine was X rayed immediately, six hours later, and again at the end of 24 hours. The Wassermann reaction in blood and cerebro-spinal fluid of all cases was negative. The cerebro-spinal fluid, as obtained by lumbar puncture, in all cases was colourless under normal or lowered tension, not spontaneously coagulable, and showed no increase of cells and only the slightest increase of protein. The Queckenstedt (jugular compression) test produced in the cervical case a rise in cerebro-spinal fluid tension of from 40 to 70 mm. only, thus indicating some obstruction in the cerebro-spinal canal, but in the thoracic cases the fluid tension quickly rose from 115 mm. to over 300 mm. in Case 1, and from 65 mm.

to over 300 mm. in Case 2, and so failed to indicate any gross blockage of the canal.

Pathology of the Tumours.

The tumour was extramedullary in each case. In Case 1 it was soft, lobulated, and encapsuled, lying within and adherent to the dura posteriorly, and indenting but not infiltrating the posterior aspect of the cord. It was ovoid and nearly an inch in length, quite free from nerve roots, and was easily and completely removed with a piece of the attached dura. Case 2 also presented a soft lobulated tumour underneath and incorporated with the arachnoid but not adherent to the dura. Fully one and a half inches in length, it lay on the right anterolateral aspect of the cord, filling up half the dural canal and compressing and displacing the cord to the left. The fourth dorsal posterior root on the right side crossed the lower part of the tumour and had to be cut in order to facilitate removal, which was complete but piecemeal.

In Case 3 a hard lobulated mass was present within but slightly adherent to the right posterolateral aspect of the dura, and indented but did not infiltrate the right side of the cord. The mass within the dura measured about three-quarters of an inch vertically and was connected to a pedicle which passed through the intervertebral foramen between the axis and the third cervical vertebra. The inner end of this pedicle formed a congested bulbous swelling in the extradural space and the outer end was connected to a larger mass in the rght side of the neck. The pedicle fitted the intervertebral foramen tightly and had produced an expansion of the opening by pressure. The mass in the neck was multilobular. A few small lobules lay close to the foramen and one, much larger, about the size of a pigeon's egg—the main portion of the tumour—lay between the muscular planes formed by the rectus capitis anticus major in front and the scalenus medius and levator anguli scapulæ behind. All parts of the tumour appeared to be enclosed in a common capsule and no trace of the right third cervical nerve could be made out. The whole of the intrathecal portion of the tumour with the attached dura was removed piecemeal and the pedicle cut across flush with the dura. No attempt was made to remove the pedicle or the larger extraspinal portion of the tumour at this stage.

The tumour in Case 1 proved on microscopical examination to be a typical meningeal endothelioma. It was composed of small whorls of spindle-shaped cells with a considerable number of hyaline concentric masses, a number of them showing deposits of lime salts—so-called psammoma bodies—but only a few hyaline strands were visible. In Case 2 the tumour was also a typical meningeal endothelioma of similar type. The spindle-shaped cells were rather loosely arranged in small whorls and contained many hyaline strands and numerous hyaline concentric masses—so-called psammoma bodies—but no calcareous deposits.

In Case 3 the tumour was of a rather different type. Microscopically it was found to be a very cellular fibroblastic growth with rather a whorled formation. The spindle-shaped cells showed a marked tendency to palisade arrangement, especially around the vascular spaces. There were no hyaline concentric masses. The tumour appeared to be a neurofibroma and probably originated from the sheath of the third cervical nerve.

Clinical Features.

The principal clinical features of the three cases are briefly summarised below. The signs were those present when the patients came under our observation.

CASE 1.—A female, aged 42, had had symptoms for one year. Feelings of coldness and numbness commenced in the lower part of the right thigh and extended within six months to the corresponding part of the left thigh. A feeling of band-like constriction in these parts was next observed and shortly afterwards the right leg began to "drag," and the patient occasionally tripped over a stone and fell. Cold and numb feelings were next experienced in the feet, and these gradually spread up throughout both legs and thighs. Two months later (eight months after the initial symptoms) the left leg began to "drag" also, so that the gait became spastic and jerky. At this time the patient began to experience involuntary flexor spasms of the hamstring muscles, first in the right leg but soon in both. Spasticity in the legs and the associated difficulty in walking became so marked that she was obliged to take to bed a month later (i.e., nine months after the onset of the initial symptoms). The lower part of the back and perineum next began to feel numb and, within a month of taking to bed, she began to experience at intervals a tight band-like feeling in the right side of the lower abdomen. This soon disappeared, but the corresponding part of the left side then became similarly affected. A feeling of tightness across the upper abdomen also appeared at this time, and the patient frequently experienced a sharp pain shooting from the angle of the left scapula round below the left breast. She then began to have considerable aching pain in the legs, the flexor spasms increased in frequency, and two months later—about 12 months after the initial symptoms—she came under our care. Normal desire to micturate was gradually lost during the illness, but she was able to empty the bladder voluntarily until after coming under our care. The bowels had been constipated since onset.

She showed complete and marked spastic paraplegia. Both legs were flexed at the knees and hips, and were painful. She was quite unable to stand or to move her legs, but there was no obvious muscular atrophy. Some cardiac failure was present; she was dyspnœic, requiring a bed-rest, and her feet and ankles were œdematous, and moist râles were heard at the bases of the lungs. Cystitis soon developed and later incontinence of urine and fæces. Sensory changes were present in both lower limbs and in the body up to a line encircling the trunk at the level of ensiform cartilage in front and the sixth dorsal spine behind. Sensibility to brush and pin-prick were diminished in front from the level of the ensiform cartilage down to the level of the umbilicus on the right side and to the level of the anterior superior iliac spine on the left; below these latter levels sensibility to brush and pin-prick was completely lost. Thermal sensibility diminished from the level of the ensiform cartilage down to the level of the anterior superior iliac spines, and was absent below this level. Deep sensibility was present but diminished from Poupart's ligament downwards—more so in the left leg. Posteriorly, sensibility to brush and to heat and cold diminished from the level of the sixth to the ninth dorsal spines on the left side, and from the sixth dorsal spine to the seventh space on the right side, and was absent below these levels. Sensibility to pin-prick was diminished on both sides of the back from the level of the sixth to the tenth dorsal spines and was absent below this. Vibration sense was absent throughout both legs, and diminished over the symphysis pubis and anterior superior iliac spines—more so on the left—sacrum, lumbar, and dorsal spines up to and including the tenth dorsal. The knee- and ankle-jerks were exaggerated on both sides, and ankle-clonus was present. Both plantar reflexes were extensor. The abdominal and epigastric reflexes were absent, but the arm-jerks were normal. The spinal level diagnosed was the seventh thoracic segment. Lipiodol was held up completely at the level of the disc between the second and third thoracic vertebræ. Six hours later, however, most of the lipiodol had passed right down to the lower end of the meninges, about one-sixth remaining at the above site, and a few drops being visible here and there on the way down. No further change was noticed after 24 hours. Partial "spinal block" was thus indicated.

CASE 2.—A male, aged 32, had had symptoms for ten months. He complained of a "cold feeling" in the front of the thighs and lower part of the abdomen, and of tingling in both feet and, about three months later, numbness of both feet and legs in addition. Gradually the right leg began to feel stiff and at this time a feeling of tightness across the lower abdomen, about the level of the iliac crests, was experienced for about two weeks. The bowels were persistently constipated, and after micturition he always felt as if the bladder were not completely emptied. Little change occurred until four months later when, with slowly increasing stiffness in the right leg, the right foot began to "drag," and both feet became so numb that he was "unable to feel the ground." One day, about a week after this, his right leg "gave way" under him, and shortly afterwards his left leg began to feel stiff also. Spasticity in both legs then quickly increased, so that he was unable to get about and began to experience spontaneous flexor spasms in one or both legs. The feeling of tightness across the abdomen then returned, he began to have much difficulty in controlling the urinary sphincters, and shortly afterwards he came under our care—ten months from the onset of the initial symptoms.

Both legs were moderately spastic and spasticity increased on flexion. Occasional twitching movements were seen in the

leg muscles. Incontinence of urine was present. (Cystitis developed shortly afterwards.) He was a sparely-built man, thin, but without local muscular atrophy. From the level of the nipples to a horizontal line midway between the ensiform cartilage and the umbilicus sensibility to pin-prick was diminished. From one inch below the nipples down to the same horizontal line sensibility to a brush and to heat and cold was diminished. Below this level thermal sensibility was absent, and sensibility to brush and to pin-prick was absent on the right half of the body and in the right leg and almost absent on the left. Posteriorly pin-prick, brush, and thermal sensibility were diminished from the level of the seventh dorsal spine downwards. Pin-prick sensibility was reduced down to the level of the tenth dorsal space on the right side and the eighth on the left; brush down to the eighth on both sides and thermal down to the tenth. All three sensations were completely lost below these levels. Vibration sense diminished from the eleventh dorsal spine downwards, and was absent throughout both legs and over both anterior superior iliac spines. The knee- and ankle-jerks were exaggerated on both sides, the right more than the left; ankle-clonus was present and more marked on the right side. The plantar responses were flexor and equal. The abdominal reflexes were absent and the arm-jerks normal. The spinal level diagnosed was the fifth thoracic segment. Most of the lipiodol was held up at the lower part of the body of the second thoracic vertebra; the rest passed to the lower limit of the meninges leaving one or two droplets on the way down. There was practically no change in 24 hours. Incomplete "spinal block" was indicated.

CASE 3.—A female, aged 23, had had symptoms for ten months. After an attack of influenza a rounded swelling had appeared fairly suddenly in the right side of neck about six months before the onset of spinal symptoms. Quickly increasing to the size of a walnut, it had then seemed to remain stationary, except that occasionally it would be slightly painful and feel a little larger. Spinal symptoms began with numbness, loss of feeling, and weakness in the right hand. This numbness and weakness gradually spread up the right arm until, four months later, the weakness had become so marked that the patient was unable to feed herself with this limb. About this time also tingling sensations appeared in the right hand and trunk, and shortly afterwards she began to experience loss of feeling in the left hand. The left arm soon began to feel numb also, and weakness and tingling sensations set in. Two months later the right leg began to feel weak and "loose about the knee"—as if it would not support her—the right foot began to "drag," and tingling sensations were experienced in the thigh. In another two months the left leg began to feel stiff, the left foot began to "drag," and tingling sensations were felt in this thigh also, and the patient was only able to get about with the greatest difficulty and with assistance. At this time she accidentally burnt her left hand without feeling it. A month afterwards tingling sensations were experienced throughout both legs, and a tight band-like feeling around the chest at the level of the axillæ. This feeling of constriction persisted, with occasional intermissions. About this time, however, sensation began to return in the right hand. About a month later flexor spasms began to affect the left arm and shortly afterwards she came under our care. The bowels were constipated and urinary symptoms were absent until after coming under our observation.

There was a rounded swelling about the size of a walnut on the right side of the neck, partly under and partly behind the sternomastoid, and with its upper edge about one and a half inches below the lobe of the ear. It was firm, non-fluctuating, and not adherent to skin or sternomastoid, but appeared to be fixed deeply in the neck. It was slightly tender at its lower part but only on deep pressure. Weakness and stiffness were present throughout both upper limbs, slight on the left and more marked on the right. There was also some weakness of the right shoulder muscles and a tendency to contracture of the flexors of the right forearm, hand, and fingers. The right arm was generally slightly thinner than the left but there was no local muscular atrophy. The lower limbs were spastic and uniformly thin below the knees. Lying in bed the patient could flex her knees and thighs but could only move her ankles and toes very slightly. She was quite unable to stand unsupported, but could take a few short steps if assisted and her body supported. Sensibility to brush, pin-prick, and heat and cold was diminished throughout the left lower limb and the left half of the trunk up to the level of the second rib in front and the spine of the scapula and second dorsal spine behind. Throughout the left upper limb sensibility to brush and pin-prick was diminished up to the level of the acromion process behind and to the lower margin of the deltoid muscle in front. Thermal sensibility was lost completely in the left hand and back of the left forearm and very much diminished throughout the rest of this arm. Vibration sense was diminished throughout the left leg, left anterior superior iliac spine, left forearm, right wrist, and over the vertebral spines from the second dorsal downwards. (With the exception of vibration in the right wrist the sensory changes in this case were unilateral.) The knee-jerks were much exaggerated and patella clonus was present—a little more easily obtained on the right side. The ankle-jerks were much exaggerated and clonus was present, slightly more marked on the right than on the left. Both plantar responses were extensor. There was a slight Oppenheim's reflex on the right side. Epigastric and abdominal reflexes were absent. Arm-jerks were all exaggerated, rather more so on the right side. The spinal level diagnosed was the fifth cervical segment. A small portion of the lipiodol injection passed right down to the lower limit of the meninges, the bulk, however, remained in the cisterna magna with a portion extending down to the middle of the body of the axis. Twenty-four hours later there was practically no change, so that an almost complete "spinal block"—the upper limit of which was at the middle of the body of the axis—was indicated.

Commentary.

These cases were operated upon under intra-pharyngeal nitrous oxide oxygen anæsthesia. The operative technique and the after-treatment were essentially the same as described in our previous communication, except that in Cases 1 and 3 the dura mater was left open after removal of the tumour. In the case of the dumb-bell tumour (Case 3) only the intrathecal part was removed, it being intended to remove the extraspinal portion at a subsequent operation, but the patient continued to vomit after the operation and died rather suddenly 15 hours later. The autopsy revealed the cause of death to be acute dilatation of the stomach, the stomach almost filling the abdomen. The prognosis in the other two cases was considered rather unfavourable on account of the previous cardiac failure and the cystitis in Case 1 and the severe cystitis in Case 2. Both, however, stood the operation well and slowly and steadily improved afterwards.

In Case 1 the patient began to have some return of feeling in the right foot within a week of the operation, and ten days later she was able to feel both her feed and legs being touched with the hands. Three weeks after the operation the tight band-like feeling around the waist had disappeared and she was able to flex the right ankle and knee and flex and extend the toes. Both legs, however, were rather painful and somewhat more spastic than before the operation. Three and a half months after the operation she had regained complete control of the sphincters and she began her first attempts at walking again. By this time the stiffness in the legs had considerably lessened, but occasional flexor spasms occurred. When last seen, eight months after the operation, this patient was able to flex and extend the legs fully, although with some effort, for there was still some spasticity and adductor spasm. She was able, with some assistance, to take short walks daily, but when walking she kept her knees rather flexed and took short steps. Sensation had completely returned except for some diminution of vibration sense in the left ankle, diminished thermal sensibility in the sole of the left foot, and absent joint sense in the left great toe. Flexor spasms of the legs were still troubling her, particularly at night, and a slight feeling of constriction was present around the waist. The left plantar reflex was doubtfully extensor.*

In Case 2 sensation commenced to return in the legs two days after the operation. Within ten days he was able to draw the right leg up and could feel a pin-prick in this leg distinctly. A week later he could feel a pin-prick in the left leg and deep pressure in both, and two days later he began to regain control over the bladder. About ten weeks after the operation he could move both his legs, but spasticity had increased. A month later the spasticity had become very marked and adductor spasms so troublesome—his legs remaining crossed—that orthopædic treatment was decided upon. The right obturator nerve was cut, tenotomy of the right adductor longus was

* Two months later her condition generally had greatly improved and she could walk much more freely without assistance.

performed, and the remaining adductors and hamstrings on both sides were stretched. These measures effectively corrected the "crossed-leg" deformity, but some contraction of the hamstrings persisted. Within a fortnight, however, he was able to lift both legs off the bed and move them at all joints. He had now, also, complete control over the bladder. Progress in walking continued slowly but was considerably hampered by increasing contracture of the hamstring muscles, preventing him from straightening his legs. Consequently, some eight months later, further orthopædic treatment was undertaken. Tenotomy of the hamstrings on both sides was performed and the legs were put up in plaster, fully extended, for three weeks. At the end of this period he commenced walking again, was able to stand erect, and soon was getting about with much less fatigue and more comfort. The bowels and bladder were acting normally. When last seen —some 15 months after the removal of the tumour—he looked and felt very well indeed. He was able to walk erect and quite smartly but with just a suggestion of stiffness at the knees. He had no tingling, pains, or spontaneous flexor spasms in his legs and no tightness around the body. He had complete control over his sphincters but constipation was rather troublesome. While the legs showed spasticity in extension, he could flex and extend them easily at all joints. The knee-jerks were exaggerated and equal, and ankle-clonus was present on both sides. The plantar responses were slightly extensor. Sensory recovery was marked. Sensibility to pin-prick had completely recovered. Thermal sensibility also was normal, except for a zone of slight diminution encircling the body from the level of the nipples to that of the ensiform cartilage. Sensibility to the brush was still diminished, but only slightly so, in the legs and trunk up to about the seventh dorsal spine behind and the nipples in front. Vibration sense was still slightly diminished from the knees downwards, a little more so in the right leg than in the left.

Clinical and Laboratory Notes.

A NOTE ON THE PRESENCE OF ANTIBODIES TO HERPES VIRUS IN POST-ENCEPHALITIC AND OTHER HUMAN SERA.

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Two main theories concerning the ætiology of encephalitis lethargica are current. Some hold that the disease is caused by the virus of herpes simplex, which under exceptional circumstances becomes neurotropic in man. This view is based on the occasional recovery of herpes virus from the brains of patients dead of encephalitis lethargica and on the fact that herpes virus can produce not only an acute or chronic encephalitis in rabbits, but also, as Zinsser [1] has shown, a chronic encephalitis in certain monkeys which is not unlike encephalitis lethargica in man. Others, however, are unconvinced by this evidence and maintain that the cause of encephalitis lethargica is an unknown specific neurotropic virus. (See Zinsser's [2] recent review of the problem.)

It seemed that some light might be thrown on the ætiology of encephalitis lethargica by examining sera from post-encephalitic patients for antibodies to herpes. If herpes virus were the causal agent of encephalitis lethargica, antibodies might be expected to be present in view of the following considerations. First, many neurologists believe that post-encephalitic parkinsonism is a manifestation of a chronic infection with the agent of encephalitis and not a mere residuum due to destruction of nervous tissue. Secondly, rabbits infected with herpes, including those suffering from a chronic form of encephalitis, possess neutralising antibodies in their serum. Flexner [3] reported in 1923 that convalescent epidemic encephalitis serum was somewhat more protective against herpes virus in rabbits than were a few samples of normal human serum. Since our investigation was begun Zinsser and Tang [4] have published the results of a study on the same lines. They found that 39 of 45 post-encephalitics (86·7 per cent.) had antibodies to herpes in their serum, while only 11 out of 17 adult controls (64·7 per cent.) showed antibodies. Normal children gave an even lower percentage of positive results (43·4 per cent.). Zinsser and Tang were naturally reluctant to draw conclusions from these figures. They tested for anti-herpes properties in sera by incubating the serum to be tested with 2 to 4 minimal lethal doses of virus and inoculating rabbits intracerebrally. This method, though it apparently gave consistent results, is expensive in animals and allows very little margin for possible variation in the susceptibility of the rabbits.

Our investigations were undertaken because we had at hand a simple method of testing for antibodies to herpes. We found, as Gay and Holden [5] and Wilson Smith [6] have done, that some strains of herpes give very satisfactory lesions when inoculated intradermally into rabbits, and that with such a technique sharp neutralisation of virus by immune serum can be shown. We used a strain (E.L.i) kindly given to us by Dr. J. R. Perdrau; this at first gave unsatisfactory intradermal lesions, but after a few passages in tissue cultures was very satisfactory for our purposes. The virus multiplied readily in cultures of rabbit testis in dilute rabbit serum, as lately described by one of us (Andrewes[7]). Fluid from tissue culture was mixed with an equal volume of immune serum, and after a few minutes' contact at room temperature, 0·1 c.cm., was inoculated intradermally.

Results.

Human sera were found to fall sharply into two groups. Either they did not influence at all the size of the lesion produced by the virus, or they neutralised a thousand infective doses completely. It will be seen from Table I. that 21 out of 28 (or 75 per cent.) control sera contained antibodies to herpes; such antibodies were less evident in the few sera examined from normal persons, chiefly medical students, than in sera of assorted hospital patients, but the possible significance of this difference has not been further studied. In Table II. are set forth the results of testing the sera of 25 post-encephalitic patients; brief details are given of the history of their disease. Antibodies were found in the serum of 18 out of 25 patients (or 72 per cent.), approximately the same percentage as in the control group.

All the patients whose serum was tested were asked whether or not they had ever suffered from "herpes simplex," the nature of which was described to them. Very few replied in the affirmative, but it is not felt that much reliance can be placed upon the answers obtained. In addition to the unselected group of normals in Table II., sera were examined from seven subjects, all workers at the National Institute for Medical Research and all liable to frequently recurring attacks of labial herpes. Antibodies were present in all seven of these sera. It is of particular interest that one of them had had an attack of herpes six days before he was bled, while another had an attack four days after blood was taken. Herpes simplex is one of the few known virus

diseases which does not lead to lasting immunity at least in man. It appears from these observations that in some obscure way herpes can recur in man despite the presence of antibodies in the serum.

TABLE I.—*Antibodies to Herpes in Control Sera.*

Case.	Age.	Sex.	Present condition.	Antibodies to herpes.
1	44	M.	Gastric ulcer.	+
2	57	M.	Colitis.	+
3	27	M.	Hysterical palsy.	+
4	17	F.	Nephritis.	0
5	23	M.	Pneumonia.	+
6	59	M.	Tabes dorsalis.	+
7	14	M.	Dyspituitarism.	+
8	18	M.	Chorea.	+
9	52	M.	Arthritis.	+
10	Ad.	F.	Gynæcological patients.	+
11	,,	F.		+
12	,,	F.		+
13	,,	F.		+
14	,,	F.		+
15	,,	F.		+
16	50	F.	Syph. and herp. zost.	+
17	55	F.	Cerebrovascular disease.	+
18	38	M.	Mediastinal sarcoma.	+
19	Ad.	F.	Nephritis.	+
20	18	F.	Pneumonia.	+
21	59	M.	Cerebrovasc. syph.	+
22	38	M.	Gastric ulcer.	+
23	Ad.	M.	Normal.	0
24*	,,	M.	,,	0
25*	,,	M.	,,	0
26*	,,	M.	,,	0
27*	,,	M.	,,	0
28*	,,	M.	,,	0

* Medical student. Ad. = Adult. There was no history of herpes simplex in any patient except Case 22 and a doubtful history in Case 19.

TABLE II.—*Antibodies to Herpes in Post-encephalitic Sera.*

Case.	Age.	Sex.	History of encephalitis lethargica.	Onset of parkinsonism.	Date of taking serum.	Antibodies to herpes.
29	51	M.	Spring, 1920.	March. 1929	—	+
30	22	M.	July, 1923.	1926	—	0
31	21	M.	June, 1925	1925	—	+
32	31	F.	Jan., 1925.	1927	—	+
33	26	F.	? 1924.	1924	—	+
34	45	M.	? 1924.	1925	—	+
35	24	M.	Nov., 1924.	1925	—	+
36	44	M.	June, 1918.	1926	9/1/30 19/2/30	+ +
37	35	M.	? 1924.	1925	—	0
38	21	M.	Dec., 1919.	1926	—	0
39	41	M.	? 1924.	1925	—	+
40	16	M.	June, 1925.	1928	—	0
41	22	F.	1923	1926	—	0
42	41	F.	1925	1927	9/1/30 19/2/30	+ +
43	31	M.	1927	1927	—	+
44	23	M.	May, 1925.	1925	—	+
45	30	M.	May, 1925.	1926	—	+
46	24	M.	July, 1924.	1927	—	+
47	36	F.	1926.	1926	—	+
48	46	M.	1925.	1925	—	+
49	30	F.	1924	1927	21/11/29 26/11/29	+ +
50	24	F.	1924	1926	— —	0
51	60	M.	1921	1921	—	+
52	35	F.	1925	1927	—	+
53	50	F.	1922	1923	—	0

Parkinsonism was present in all the cases. There was a doubtful history of herpes simplex in Cases 35 and 38, but no history in any other patient.

Yet that serum can prevent the virus from infecting a rabbit's skin or a tissue culture of rabbits' testis.

Summary.

Antibodies to herpes virus were found in the serum of 72 per cent. of 25 patients with post-encephalitic parkinsonism and in 75 per cent. of 28 unselected controls. These observations, therefore, lend no support to the view that the virus of herpes simplex is the essential cause of encephalitis lethargica.

Seven subjects with frequently recurring labial herpes all had antibodies in their sera; the significance of this is discussed.

One of us (E. A. C.) is responsible for the clinical diagnosis of the patients and for obtaining the sera; the other (C. H. A.) for the animal tests. We thank Prof. F. Fraser for permission to utilise the material under his care and Prof. Major Greenwood for kindly examining the available figures. He assures us that statistically there is no significant difference between the post-encephalitic and control sera either in our series or in that of Zinsser and Tang.[4]

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AN IMPROVED METHOD OF LIGATURING THE EXTERNAL CAROTID ARTERY.

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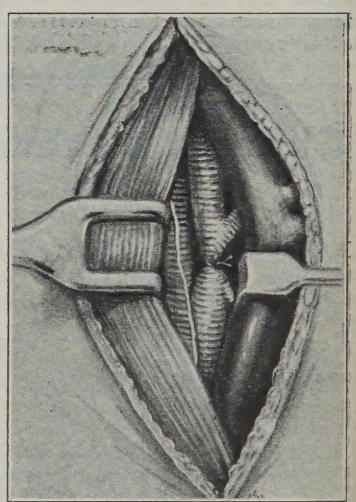
IT occurred to me some time ago that the operation of ligature of the external carotid might be simplified. I have on two occasions carried out a modified procedure which I am convinced possesses definite advantages over the classical method. The preliminary stages of the operation are the same as those described in the text-books. The carotid sheath is exposed and incised over the internal jugular vein, which is freed from its fascial covering for a length of from 2 to 3 inches in the neighbourhood corresponding to the region of the carotid bifurcation. The vein is now carefully separated from underlying structures, including the vagus nerve. It is then retracted towards the mesial plane, instead of laterally as in the classical operation, until the bifurcation of the common carotid comes into view. The hypoglossal nerve tends to be retracted forwards with the vein and may never come into sight; of course, care must be taken to avoid damaging this nerve or its branch, the descendens hypoglossi. The actual ligation of the external carotid is carried out at the site of election by adopting the same technique as in the classical procedure. Sometimes it may be advisable to tie the ascending pharyngeal artery. In uncomplicated cases this method is simpler than the older one.



Drawing to illustrate method of ligature of external carotid artery.

Difficulty of the Recognised Route.

The operation by the recognised route may be extremely difficult, where there is a regular plexus of large veins over the bifurcation of the carotid and more especially if in addition there are enlarged glands, the seat of acute or chronic inflammation, possibly associated with adhesions. The veins which

enter the internal jugular in this region from in front vary much in size and arrangement, but the following may be present: the common facial, lingual, pharyngeal, and sometimes the superior thyroid vein. In practically every case they hamper direct access to the external carotid, and frequently more than one vein has to be divided and double-ligatured. The object in tying the external carotid is to diminish the blood-supply to the parts to which this vessel is distributed. Ligature of a large vein such as the common facial to a certain extent defeats that object by increasing the venous congestion.

Two Cases Related.

I will here cite two cases, one where ligation was carried out by the time-honoured procedure, the other where the modified method was employed. The first patient, a woman, was admitted to the London Hospital with the history that her medical attendant had incised a peritonsillar abscess on three occasions. She had lost a large quantity of blood, and bright blood was still oozing from an incision in the neighbourhood of the right tonsil. The hæmorrhage could not be controlled at its seat of origin, and I decided to ligature the external carotid. The operation was much complicated by an acute inflammation of the glands and periglandular tissues in the upper part of the neck, and a plexus of veins over the region of the carotid bifurcation. Moreover, the veins were difficult to define and their walls were very friable. On account of these conditions the operation was extremely difficult. The external carotid was eventually ligatured and the hæmorrhage from the pharynx immediately ceased and did not recur.

Recently I was called to the London Hospital on account of severe hæmorrhage from the pharynx in a patient who had been treated for sarcoma, originating in the right tonsil and accompanied by secondary involvement of the cervical glands. The patient, a man of 25, was in a very critical condition. Bleeding was taking place from an ulcerated area on the right side of the pharynx. The hæmorrhage was evidently arterial. It could be controlled by a swab firmly held over the spot, but the instant this was removed it recurred with such vigour that it would have been futile to try to find the bleeding vessel. I therefore decided to ligature the right external carotid. The case had been under treatment for a long time with X rays and a month previously with radon needles, and considerable fibrosis of the tissues of the neck had taken place. It was anticipated that the operation would be difficult, and as the patient was in a state of collapse from loss of blood following an exhausting disease, it was thought necessary to carry out the operation as quickly as possible. (Mr. J. H. Challis with great skill, under light anæsthesia, managed to pass an intratracheal catheter while the patient was still bleeding profusely.) Once the catheter was in position it was a matter of no great difficulty to control the hæmorrhage and—notwithstanding the matting of the tissues—to expose the external carotid, adopting the route I have suggested, and place a ligature round it. The carotid was the only vessel of any size which was ligatured during the operation.

A week later alarming hæmorrhage recurred. In my absence my colleague, Mr. Charles Donald, kindly dealt with the emergency. He has furnished me with the following notes:—

"Under circumstances of great difficulty, with an assistant compressing the bleeding point by a finger within the mouth and frequent alterations in the position of the head of the patient—necessitated by the anæsthetist when swabbing out the pharynx in order to keep the airway clear—I endeavoured to tie the left external carotid in the classical way through an incision in its line with the midpoint about level with the great cornu of the hyoid. On cutting through the fascia in front of the sternomastoid, I experienced great difficulty in making out any further plane owing to dense fibrous matting of the tissues caused by previous X ray and radium treatment. The internal jugular vein was then met, very adherent to surrounding structures. During the process of separation from these, the vein or its tributaries was torn in two or three places, and on retracting it backwards only a very limited view of the deeper structures was obtained. An artery was found which appeared to be in the position of the external carotid, although this could not be absolutely confirmed. As the patient was in extremis and the anæsthetist wished him off the table at once, I tied it without further investigation. It was found post mortem to be the internal carotid."

These cases illustrate the advantage of approaching the vessel by the route I adopted in the second patient.

TONSILLECTOMY BY DIATHERMY, USING SURFACE ANÆSTHESIA.

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The comprehensive list of diseases for which tonsillectomy is now advocated and the large variety of organisms which show an undoubted preference for this area explain why the tonsil has assumed importance as the most common origin of general ill-health. Tonsillectomy is the most commonly performed of all operations. It is widely regarded as an essential step in the treatment of many cases of gastro-intestinal disease, gall-bladder troubles, rheumatic affections, eye and ear disease, skin conditions, nervous complaints, and most blood diseases, since it limits the downward spread of infection through the alimentary tract. Further, it is universally agreed that tonsillectomy must mean the eradication of the entire tonsil, which must be removed, together with the so-called capsule of connective tissue.

We are now taught to rely solely on the slow, blunt dissection method. This is admittedly a method which, apart from the skill and time required, necessitates a long and very deep anæsthesia which, to my mind, is a dangerous and unnecessary risk. The snare and the guillotine, according to present-day literature, too often leave behind a considerable portion of lymphoid tissue, which continues to grow, causing further pathological difficulty. Apart from the anæsthetic risk, many patients are unsuitable for this method of treatment on account of fear or age or some other factor predisposing to surgical shock. Other methods of eradication are: local applications, X rays, radium, the simple cautery, and diathermy. Both with X rays and radium a definite shrinkage of all lymphoid tissue generally does occur with accurate dosage. In the tonsils, however, there is a concentration of lymphoid tissue within a relatively small area, so that the mucous membrane has become invaginated with numerous crypts. The end-result of such treatment is a shrunken but fibrous tonsil, which provides a focus for further infection. Pathogenic organisms have repeatedly been detected in the crypts after treatment by X rays and radium. The method of irradiation cannot be sufficiently localised in its application to avoid the possibility of seriously affecting the activity of the thyroid-parathyroid mechanism or other neighbouring structures, not to mention the well-known risk of radiation dermatitis. The simple or electric cautery involves pushing a heated metal electrode through tissue which rapidly conducts away the heat and so limits the effect to a very small zone around the electrode. To my mind this method is practically useless, since the operation is of necessity incomplete and there is a great risk of secondary hæmorrhage.

Diathermy needs no general anæsthetic, causes no shock of any kind, entirely eradicates the tonsil, and carries no risk of hæmorrhage, primary or secondary. Heat, sufficient to destroy the tissue, is actually generated in the tonsil itself and this heat can be controlled at will. A considerable zone can be operated from a single point; the largest tonsil can be treated from two points of application, while the vast majority can be destroyed as one single unit. In happy contrast with the older cautery method, there is no complete katabolism of tissue protein, since the process stops short at the stage of coagulated protein. I think the consequent absence of toxic shock worthy of mention.

The Technique Described.

The technique I now describe has been evolved as the result of observations on more than 150 tonsillectomies on adult patients which I have done

within the last four years. I do not think the method so suitable to children under 14 years of age, since to them a general anæsthetic is usually less alarming than the appearance of electrical apparatus. The process here called diathermy is strictly a combination of true diathermy and fulguration. Broadly speaking, the stage of true diathermy coincides with the production of sufficient heat within the tonsil to kill the tissue and boil contained liquids. Fulguration is the condition of electrically "arcing" off the surface of the tonsil in order to seal efficiently and permanently both arteries and lymphatics. There are no contra-indications to this method which would not apply to the simplest of surgical operations. The general health of the patient should be noted and oral sepsis eliminated as far as possible. As already mentioned, each tonsil is surrounded by a maximum surface of mucous membrane, and this fact ensures the success of cocaine spray anæsthesia. No general anæsthetic has ever been required and, of course, the use of ether would be precluded by the presence of high tension electricity. I have found it quite unnecessary to inject cocaine, and it has always been sufficient to spray the throat with not more than 2 grains of cocaine hydrochloride freshly dissolved in two drachms of water.

The tonsillar electrode is usually a small metal ball mounted on a curved insulated handle of ebonite. A variety of holders have been constructed to cope with any angle of application. As the result of experiment, no advantage was found in using more than one indifferent electrode, and finally a sheet of thin lead, 8 in. by 6 in., has been selected as standard; it is covered by four thicknesses of plain lint saturated in 20 per cent. salt solution. This electrode is securely strapped to one wrist and bears a large M.S.A. diathermy terminal. The frequency of oscillation of the diathermy machine is not at all critical, and the several well-known makes of apparatus which I have tested all gave excellent results with a diathermy current of two amperes. This current can constantly be obtained once the necessary setting for the particular machine has been determined and, when used with the resistance of an average patient, rapidly causes a rise of temperature in the tonsil to approximately 100° C. As soon as anæsthesia is complete the indifferent electrode is fixed to the forearm, the patient comfortably seated in a supporting chair, and the tongue depressed by means of a glass spatula. The active electrode is then placed in firm contact with the tonsil and the current switched on. The tonsil soon shows, radiating from the centre of the active ball electrode, a zone of coagulated tissue, which rapidly desiccates. Complete destruction of the tonsil is effected slightly beyond this area of coagulation. The whole process lasts but a few seconds, after which the active electrode is deliberately arced a few times from the surface of the tonsil in order to seal any vessels. It may be a little difficult at first to determine the depth to which coagulation has taken place, especially if the operator is unfamiliar with more general surgical diathermy. Much useful information was acquired by the writer from sections of raw beef treated with varying electrodes and intensities. It is occasionally advisable to complete the tonsillectomy in two, or very rarely, three, stages, but this only applies to very large tonsils, or, alternatively, to extremely nervous patients.

Post-operative Procedure.

The patient is invariably seen at the end of a month, and again after three months. Should a fragment of lymphoid tissue have escaped, it is, of course, removed at this stage. There is no need to hospitalise the patient and the discomfort is relatively slight. The operation is practically painless. During the 36 hours or so following the treatment the peritonsillar tissue becomes œdematous, which I believe to be the rule in all operations involving mucous membrane. A suitable hypnotic such as Allonal will ensure the first night's sleep. I find approximately 20 per cent. of cases show a rise in temperature, which rapidly subsides in a few hours, and for this reason I have lately ordered all patients to remain in bed for 48 hours after operation. An antiseptic mouth-wash is ordered to be used after each meal, but gargling is absolutely forbidden, lest undue strain be placed on the throat. The coagulation slough commences to separate in a few days and the process continues for about ten days or a fortnight. During the latter part of this period the slough may prove slightly malodorous, but this does not seem to be realised by the patient, and of course disappears with the departure of the slough. Secondary infection of the slough or underlying tissue has not occurred in any instance. The general reaction always remains slight and the local disturbance reasonable. No secondary hæmorrhage has occurred throughout this work. A soft glassy scar, with practically no contraction of tissue, invariably results, and is assumed to be evidence of a downgrowth of epithelium.

I believe that this application of diathermy to tonsillectomy possesses at least all the advantages of other methods, and yet none of their disadvantages.

Medical Societies.

HARVEIAN SOCIETY.

AT a meeting of this Society on April 10th, with Dr. P. MONTAGUE SMITH, the President, in the chair, Sir THOMAS HORDER opened a discussion on

HIGH BLOOD PRESSURE.

His interest in the subject, he said, was chiefly clinical; he differentiated between three types of case. In the first group he placed those patients with evidence of definite organic disease due to arteriosclerosis or atheroma—i.e., those in whom there was diffuse arterial degeneration. This was the largest group of the three. Patients with this type of high blood pressure showed associated changes in the heart and kidneys, and later developed the renal condition severally termed granular kidney, interstitial nephritis, and gouty nephritis. Symptoms were protean and included heart failure, angina, renal insufficiency, retinal changes, hæmorrhages, thrombosis, and uræmia. Prognosis and treatment were less hopeful with this type of case than with the others, and it was important to assess the state of the myocardium. The second group was also the next largest. It comprised those cases in which the onset of symptoms and the development of high blood pressure were associated in the mind of the doctor, but in which there was no certain evidence of organic change in the heart, kidneys, or blood-vessels. These cases he classed as hyperpietics, but the line dividing them from the arteriosclerotic type was indefinite. Finally, there was a small group in which the renal element was dominant; there might be a mixed nephritis or frank parenchymatous nephritis. The patients were usually women in the late thirties with a blood pressure registering 240 to 300 systolic and 120 to 150 diastolic. They had albuminuria, retinal changes, and no œdema; they usually died in uræmia.

Hyperpiesia.

The cases in the second group might be subdivided into five minor classes. First, the plethoric type of man of sedentary habits, with a tendency to overeat. Hypertension in these cases might be in some degree compensatory to cope with increased metabolism. Secondly, there were cases where hypertension was due to some exogenous poison, the commonest of which was alcohol. Thirdly, there were menopausal cases. Women in the late forties often entered on a stage of hypertension which might last some months or years and then, gradually or occasionally suddenly, subside. At one time he had thought a systolic pressure of 175 the limit beyond which these cases should be considered pathological, but he had seen women with a systolic pressure of over 200 emerge from this phase, and he was no longer prepared to set a definite limit. The diastolic pressure did not rise pari passu with the systolic in this group, and the

greater the lag the better the prognosis, since the diastolic pressure represented the permanent strain on the heart and vessels. Men often seemed to go through a similar phase of hypertension, but later in life than women. Boys at puberty often experienced a similar rise in pressure, especially those boys in whom the heart had given cause for concern. Some cardiologists said that they could detect thickening of the brachial arteries in these cases but he did not know how they did it. He considered that the rise in tension might be a compensation for heart strain, since he was not one of those who held that the heart could not be strained by exercise. Fourthly, there was a group of nervous hyperpietics. In many of these the patient's knowledge of his high blood pressure helped to keep it high. Good effects could be got in these cases by encouraging equanimity. Finally, were there possibly cases which might be called essential hyperpiesia? Such patients had a blood pressure of 200 systolic, 100 diastolic, all their lives, without evidence of toxic or other causes. They complained of headache, giddiness, and lassitude. If these cases were understood they might help to explain raised arterial tension in general. Were they, perhaps, the expression of an endocrine disturbance, and, if so, of the adrenal or the pituitary, or both?

The will-o'-the-wisp of focal sepsis had received much attention in cases of hyperpiesia. A diffuse sepsis might also be considered, affecting the whole of the upper respiratory passages or a large section of gut. The evidence was elusive. Our predecessors who called these patients gouty were as near the truth perhaps as ourselves in our eternal search for sepsis.

Exacerbations of symptoms occurred from time to time, accompanied by waves of hypertension. Intensive treatment should be undertaken during these attacks. The prognosis was serious until organic disease was excluded; even then a patient with high tension could not be regarded as a good life. He disliked any case in which physical examination failed to reveal anything abnormal, and if there was a family history of arterial disease he liked it even less. A man was not only as old as his arteries, but his arteries were the resultant of the arteries of his forbears.

Treatment.

Early diagnosis of high tension should lead to prophylactic treatment. It was impossible to change a temperament, but strains and stresses could be diminished. Reassurance in these cases was a form of treatment, and, if accepted, often caused a fall in tension. It should be explained that high blood pressure was not a disease but a symptom, and probably a valuable adjustment. Rest and diet must have their place; it was less important to limit the diet in any particular than to reduce the whole amount taken. Much fluid should be avoided, since water was secreted by the kidneys, not merely diffused, and therefore threw more work on them. Portal depletives such as mercury and salines were valuable, and constipation should be corrected. Warm baths and high frequency had their place, and venepuncture was valuable during exacerbations; he preferred to remove 50 to 100 c.cm. of blood daily for a few successive days rather than to take a larger quantity on a single occasion. Drug treatment included iodine, iodides, and occasionally nitrites. Digitalis was often helpful; in these cases the heart often needed tonics when it was erroneously imagined that depressants were required. Anabolin were still on trial but had given no impressive results so far. Thyroid and bromide were useful for menopausal and nervous cases. For each individual the state of the heart, the kidneys, the vessels, the nervous system, and the tissues must be assessed. Success depended on the care given to the individual case.

Discussion.

Dr. GEOFFREY EVANS agreed with Sir Thomas Horder that it must be decided in every case whether the condition was functional or organic, but he doubted whether a distinct line could be drawn between the two. In the menopausal cases he had found that the blood pressure rose, and then either returned gradually to normal, or remained high and increased, or else fell below normal and remained there. The first of these courses he regarded as indicative of functional disease, the second of organic. The ætiology was the same; possibly some pathogenic agent caused a simultaneous change in function and in structure, but one change might outbalance the other. The prognosis was better when structural changes were not apparent. The cause of the condition should always be sought. He described the case of a medical student who at the age of 19 was told by one doctor that he had a high blood pressure, and by four that he had not; he lived a tranquil temperate life to avoid arterio-sclerosis, and at the age of 48 had a systolic pressure of 240 and a diastolic of 120. He had been developing this hypertension gradually, without any cause being discovered. Progress of the disease was in waves—stationary phases followed by exacerbations. Sir Clifford Allbutt had given the name of hyperpiesia to those cases with persistent high tension and without uræmia in whom death usually occurred from cerebral hæmorrhage. These were the cases which did not respond to rest and diet. At about 35 they began to develop retinal hæmorrhages; a few years later renal symptoms appeared, and at 45 they gave the typical picture of chronic interstitial nephritis. They died of uræmia, cardiac failure, or hæmorrhage. As structural and renal changes developed the prognosis became worse, but even in the absence of such changes death might occur from cerebral hæmorrhage.

Dr. J. F. HALLS DALLY said that hypertension was a symptom of many causes; it was therefore difficult to formulate a scientific treatment. Overfeeding led to the retention of waste products which were not easily secreted by the kidney. According to the French school the liver was an important detoxicating agent; he considered that in this condition the liver dysfunction was part of the general condition. Exercise was more important to restore its action than cholagogues or salines. Control of the condition should be aimed at rather than treatment. The patient should regulate his life and his diet; meat appeared to have no effect on the damaged kidney, and provided the diet was adapted to the minimum metabolic level it need not be otherwise altered. As to intestinal toxæmia, the only toxin which had so far been investigated had a depressor, not a pressor, action; oral sepsis was more important. He did not agree that a man was as old as his arteries; many patients with seriously diseased arteries lived for years. The renal condition had much more effect on the prognosis. Attempts at reduction of pressure by drugs were usually dangerous; in most cases the high pressure was essential for kidney secretion. The diastolic pressure was more important than the systolic because it was more constant and less affected by emotion. A diastolic pressure of more than 120 was usually indicative of disease of the kidneys. Apoplexy usually occurred, not in those cases with the highest pressures, but with those between 160 and 190 systolic. He only used venesection as an emergency measure, and starved the patient for three days afterwards. He had had no good results with anabolin, and all the results to be obtained from potassium iodide could be obtained equally well with French tincture of iodide. The iodine, not the potassium, was important.

Dr. A. H. DOUTHWAITE said that reassurance was not sufficient treatment for a patient during an exacerbation, and the symptoms must be relieved by reduction of pressure during the attack. He had found iodides, nitrites, bromides, and anabolin to be valueless. Thyroid and dieting had been useful in menopausal cases. In other cases he had found that venesection every two or three months worked well and relieved symptoms. At Guy's Hospital intramuscular injections of acetylcholine in doses of 0·1 g. were being given; a course of this treatment

effected a reduction of pressure with relief of symptoms lasting for a period up to six weeks. He thought that intestinal toxæmia was associated with high blood pressure in those cases with fœtor oris and sallow complexions, since these symptoms always increased during exacerbations. Experiments on intestinal toxins had been carried out by injection of a dose of the toxin into an animal; the fact that no rise in blood pressure resulted gave no indication of what would result from chronic intoxication. These substances might act by causing an hypertrophy of the suprarenal medulla, with increase of circulating adrenalin. A similar mechanism was at work during the menopause, when the ovarian hormone failed to exert its counteraction on the suprarenals, and accounted for menopausal hypertension.

Dr. ADOLPHE ABRAHAMS said that the school of Lewis did not hold that the healthy heart could be strained by exercise, but the toxic heart might. Might not some of the boys at puberty seen by Sir Thomas Horder be cases of veiled renal disease? The subject would be less involved if the height of the blood pressure was always correlated with the symptoms. He took it that Sir Thomas Horder agreed that practitioners must insist that hypertension should not be considered to be arterio-sclerosis in every case.

Dr. GILBERT ORME said he had seen many cases of transient hypertension during the late forties among male mill hands in the North of England. In all the cases which survived normal tension was regained after about two years.

Dr. R. COVE-SMITH said that probably everybody had his own normal standard of blood pressure, and no definite line should be drawn in deciding where abnormal pressures began. He found it difficult to bring increased tension into line with cardiac strain as a compensatory mechanism. Digitalis was a useful stimulant to the myocardium in cases of hypertension, and he knew of no evidence that it increased the blood pressure in the normal man.

Reply.

Sir THOMAS HORDER said that he could not prove that his young boys were not cases of potential nephritis, but he had never heard of any nephritic developments later. Changes in the vessels were not necessarily an indication of their condition; they might be healed, in which case the man was as young as the repair of his arteries. He treated his patients during exacerbations, not with reassurance merely, but with rest in bed, a vegetable, fruit, and milk diet, a fast day once a week, intensive iodine, and venesection. As to heart strain, if Dr. Abrahams would watch the finish of the boat-race he would see the text-book picture of heart strain among the rowers: pallor, dyspnœa, and the typical facies. If the coronary circulation was under the same control as the general circulation, then hypertension might very well be compensatory for heart strain by increasing the blood-supply to the myocardium.

BRISTOL MEDICO-CHIRURGICAL SOCIETY.

AT a meeting of this Society held on April 9th, Mr. C. FERRIER WALTERS, the President, being in the chair, Dr. A. D. FRASER read a paper on the

CAUSAL ORGANISM OF ACUTE RHEUMATIC FEVER

and its relationship to chronic rheumatism, cancer, and other diseases. An investigation into the pathogenesis of acute rheumatic fever had, he said, culminated in the isolation of a causal organism and the reproduction of the disease in animals. The organism had a very complicated life-history and had been found associated with many other diseases of obscure origin. It was seen in an Aschoff nodule as a nuclear body occurring singly or in pairs like dumb-bells, giant pneumococci, or a cottage loaf. It might be surrounded by a clear halo, as if encapsuled. The staining reaction to hæmatoxylin varied, being sometimes dense black, sometimes light brown. It could not be identified by special stains. A Gram-positive coccus had been isolated from a case of rheumatism. It grew well now on weekly subculture and required no special media. It was non-hæmolytic and formed acid with glucose, lactose, maltose, saccharose, and salicin. It acidified and clotted milk and produced small, uniformly pink colonies on bile agar. On nasgar the colonies were moderately large, rather opaque and moist, with even edges. It looked the same after repeated subculture as it had at first. It gave the impression of reproducing by budding. Cultures had been injected intravenously into rabbits and had caused no obvious symptoms beyond wasting, but the animals had died in less than eight weeks. Autopsy revealed large firm vegetations on the mitral and aortic valves and small white areas in the kidneys. Microscopically there was marked interstitial fibrosis of the inner half of the myocardium and the papillary muscles. In the outer half there were small focal areas of cells amongst disintegrated muscle-fibres; these consisted of large irregular cells with densely staining nuclei together with the cottage-loaf cells. The vegetations on the valves consisted of masses of cocci, mostly Gram-positive. There was, however, no inflammatory reaction in the underlying tissues. The renal abscesses proved to be more in the nature of infarcts, but no cocci were found in them. Culture produced a pure growth of the same coccus as had been injected, and this culture produced the same lesions when injected into another rabbit. The lungs showed rheumatic pneumonia and two curious types of structure lying in the small arteries or capillaries. One type was an irregular mass of nuclear material without definite structure, with rounded, clearer, bulging ends. Their appearance suggested sporulating hyphæ of some kind of fungus. Some of them clearly showed the conjugation of two cells within a capsule, one smaller than the other. The other type was a mass of acidophil cytoplasm containing small particles of nuclear material of irregular shape and size. Around these structures was marked endothelial proliferation, while the alveoli contained many cells and sometimes fibrinous exudate, together with many cottage-loaf cells and cells with budding nuclei spores.

Dr. Fraser then described the post-mortem findings in a case of chronic rheumatic fever which died during an acute attack. The large bowel had shown acute hyperæmia with black ridges running along the mucosa in the long axis of the bowel and scattered ulcerated areas, covered by a yellowish-brown thin membrane. Examination of smears from the ulcers had shown the usual flora with a predominant large bacillus, varying in its reaction to Gram stain. Among masses of mononuclear cells in the bowel wall had been polymorphonuclear leucocytes and cells with the budding nucleus. There were also large diplococci, some of which took Gram stain. Two fungi had eventually been isolated from the ulcers.

The Oömycete and the Ascomycete.

One of these fungi, an oömycete, was parasitic on the other, an ascomycete. The latter had not yet been obtained in pure culture. *Ascomycetes rheumaticus*, as he called it, grew well on all ordinary media and was a facultative anaerobe. It formed acid in glucose but had no effect on other sugars. In milk it caused a slight acidity and opalescence. It did not liquefy gelatin. Its colonies on nasgar were large, smooth, and waxy with irregular edges, and after some time hyphæ grew down into the medium. For the first day or two the cultures were like budding yeast cells, but longer oval cells appeared later and long septate branching hyphæ with large rounded cells at their ends. Occasionally two cells could be seen united by a conjugation tube. Similar cells were found in the lungs of rabbits injected with this organism; the animals died within a week, with nodules in the heart, kidney, brain, and intestine.

Oömycetes rheumaticus reproduced itself by oöspores and zoöspores. It fermented glucose, lactose, mannite, salicin, and maltose, and acidified and clotted milk. It grew well on most media, but not on carrot, unlike the ascomycete, and was a facultative anaerobe. It was a slender, septate, filamentous organism, rapidly breaking up into coccal bodies and motile bacilli in culture. In shake cultures of glucose nasgar the medium was blown apart as if with *Bacillus welchii*. Rabbits died in a few days when cultures were injected; their lungs showed many small mononuclear cells staining sky-blue with Leishman's stain. The organism was found in the blood and lung juice, and when cultured thence usually produced colonies of bacilli and cocci. The oömycete thus had a sporulating hyphal stage. It also had a gametophytic stage which was seen in the meninges and cortex of infected animals. When the gametophytic nodules were cultured in broth, numerous motile short, fat, Gram-positive bacilli appeared. These lost their motility, became Gram-negative, and split into small Gram-negative diplococci. The bacillus formed acid and gas in glucose, lactose, mannite, maltose and salicin, and acidified milk but did not liquefy gelatin. On nasgar it formed large, smooth, glistening colonies with a more or less even edge. The small diplococcus produced small opaque yellowish colonies.

Subcutaneous injection was the best method of reproducing the disease, and the result depended on the stages injected. Typical rheumatic endocarditis and pericarditis had been produced. The lungs reproduced the appearances seen in human rheumatic fever and yielded the conjugating cells of the ascomycete. In successful cases the synovial tissues showed cells and structures identical with those formed by the oömycete, and the meninges and bowel also had typical lesions.

The Fungi in Other Diseases.

The sporangial cells and cottage-loaf cells of the oömycete were to be found, said Dr. Fraser, in the tooth sockets in chronic rheumatism, and bacillary filaments and gamete cells in a mucinous matrix might be seen in the cheesy masses in crevices or pockets of the teeth. The organisms had also been found in sinus washings and pus from acute otitis and mastoiditis, in two cases of nasal catarrh, and in almost every case of tonsillitis, and in a number of catheter specimens of urine from cases of infection of the urinary tract.

In polyps and other simple tumours, spores and sporangial cells were always present, while the amount of fibrous mycelium varied. Cancers showed the same features and in addition cyst-like cavities containing variously shaped nuclear bodies within a clear membranous capsule. Tumours with these cysts putrified very rapidly and yielded short, thick, square-ended bacilli having all the culture characteristics of the oöspore bacillus. Sarcomas had been found to contain a predominating number of the tubular mycelial hyphæ. The urine and sputum of cases of neoplasm always contained some of the elements of the oömycete. The fibrous mycelium and oöspores of the oömycete had been found in a collection of gastric ulcers, gall-bladders, vaginal smears, and sputa from pneumonia, as well as in the stools of infantile diarrhœa.

Discussion.

The PRESIDENT congratulated Dr. Fraser on his work. He queried whether there might prove to be some relationship between this oömycete and the streptococci which Rosenow had found so widely distributed. He asked if Dr. Fraser had any idea as to the source or original host of this fungus.

Dr. CAREY COOMBS said that Dr. Fraser's presentation of his views was such as almost to persuade one to believe in this all-pervading fungus. For the present, however, he felt obliged to adopt an attitude of reserve, for the following reasons: (1) He had examined specimens from a considerable number of cases of acute rheumatic infection of the heart and other tissues and the appearances that he had seen were identical with those described by Dr. Fraser. The dumb-bell cells, however, he had regarded as phases in an endothelial reaction to irritation. (2) The experimental lesions that Dr. Fraser showed were similar to those which he (Dr. Coombs) had seen in animals inoculated with streptococci derived from a number of sources both in this country and elsewhere. (3) The indirect evidence in favour of a streptococcal basis of rheumatic infection was, he thought, worthy of note; there was, for example, its relation to tonsillitis, a lesion thought by most observers to be streptococcic in origin. If Dr. Fraser's view that streptococci are but one phase in the life-cycle of a fungus were true, the whole of bacteriology must be rewritten.

Dr. P. WATSON-WILLIAMS expressed surprise that Dr. Fraser should not have found sporangial cells in rheumatic pneumonia, but he recalled that Poynton and other observers had failed to find any organisms in Aschoff's nodules. He had frequently had washings from nasal sinuses examined by direct smears. As a rule nothing but morphological cocci had been reported present, but it was true that occasionally yeast-like bodies had been described in the smears.

Dr. FLEMING asked whether Dr. Fraser's theory helped to explain the peculiar uniformity of the incubation period which followed streptococcal infection.

Dr. ALEXANDER asked if Dr. Fraser thought that this oömycete converted healthy tissue cells into cancer cells.

Dr. R. C. CLARKE found some difficulty in believing that such different diseases as colds in the head, gastric ulcer, erosions of the cervix, and glioma of the brain were merely varying reactions to the same infection.

Dr. A. T. TODD said that by the injection of simple serum in animals similar rheumatic and carditic lesions had been obtained. He suggested that the effects in Dr. Fraser's animals might be due to anaphylaxis. He agreed with Dr. Fraser that there was an antagonism between chronic rheumatism and cancer; why this should be so if the two conditions were caused by the same organism he did not understand.

Reply.

Dr. FRASER admitted that the whole book of bacteriology would need to be rewritten if his observations proved correct; he recalled American observers who had recently shown mutation between bacilli, cocci, and amœboid organisms. He claimed that the typical pericarditis which he had produced by the injection of the oömycete in animals was not produced by an injection of streptococci. All sorts of unknown appearances had been explained by calling them phases in inflammatory reaction or contamination. A few months ago he had described true Aschoff's nodules in the lung. He pointed out that sporangial forms became unrecognisable in dry smears, but showed their definite structure in wet preparations. He was convinced that many cases of pneumonia were due to this mycotic infection; the pneumococci if carefully examined appeared to be in reality oömycetes. Cancer was a fungous growth of oömycetes and ascomycetes; the spermatozoids entered the tissue cells and activated them so that they became cancer cells. He thought he had only got on to the edge of a new group of infecting agents, but at any rate with this fungus he could produce experimental rheumatic lesions in animals. He had never seen anaphylaxis in an animal produce conjugating cells in the lungs.

BURNING A HOSPITAL.—Owing to the Dorset County scheme for a new institution, Yeovil Isolation Hospital, at Windwhistle Bridge, a few miles away, is no longer needed. Having in view the possibility of infection the Town Council decided to burn the building, and last week it was saturated with paraffin and petrol and completely destroyed.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

At a meeting of this Society held on April 11th the chair was taken by Dr. J. J. BUCHAN, the President, and a discussion on

MENTAL DEFICIENCY AND LUNACY IN RELATION TO PUBLIC HEALTH

was opened by Dr. W. M. ASH. The relation between mental deficiency, lunacy, and public health was, he said, of the closest, and any attempt at separation would be generally inadvisable. Up to the end of the nineteenth century mental deficiency and lunacy had been dealt with by nothing more nor less than a brutal prison service, but to-day they were on a par with other public health services, and prevention should start at an early age. The object of child guidance was to unravel the tangle of social, physiological, medical, and psychological conditions which caused a particular child to become a misfit in society. Here was an excellent example of team work. The social, physiological, and medical members of the team were already part of the public health service. The psychological member should also be a part of that service, and his clinic should be a department of the general maternal and child welfare and school clinic. The importance of the early recognition of mental defect was admitted by all, and school medical officers were supposed to be capable of deciding when expert advice was necessary. The expert should therefore be available as part of the school medical staff. The suggestion that mental health in school children should be under an independent mental health service was not a good one. Mental and physical health could not be separated, and a dual arrangement would cause overlapping and unnecessary interference and expense. Nor was there any line of separation between mental deficiency under and over the age of 16. Children under five, children of school age, adolescents, and adults formed a continuous series at any phase of which mental hygiene was and mental treatment might be necessary. The purely legal breaks at the ages of 5 and 16 were fortunately minimised by the happy circumstance that the Chief Medical Officer of the Ministry of Health was also the Chief Medical Officer of the Board of Education, while the Ministry of Health was the parent body of the Board of Control. Similarly, the local medical officer of health was also school medical officer, maternity and child welfare officer, and often mental deficiency officer, and received information from the time of the birth of the child under the Notification of Births Act. This unity of health service provided continuity of supervision throughout life. Again, there was no line of demarcation between the dull and backward and the feeble-minded or between the educable and the ineducable defective, and there was great advantage in having them all under one control. There was, in fact, no phase of a mental health service which could not with benefit be incorporated into the existing organisation of the public health service. The expert on mental diseases should be on exactly the same footing and as much an integral part of the public health service as the expert for tuberculosis, orthopædics, or ear, nose and throat.

The health visitor was maternity and child welfare nurse, school nurse, tuberculosis nurse, mental deficiency visitor, blind persons' visitor, and now infant life protection visitor. She was essentially a highly trained woman, her duties carried her into almost every household within her area, and she was almost universally welcomed as an advisor and a director as to where expert advice could be obtained. Mental deficiency carried with it a stigma, and a special visitor from a department dealing with mental health would often be resented. Earl Russell had urged in the House of Lords that early mental treatment should at all costs be kept away from the machinery of insanity. Obviously the best person to use as the first line of ascertainment in mental health was the general health visitor.

Unity of Command Essential for Efficiency.

The report of the Mental Deficiency Committee strongly urged close coöperation between the mental treatment service, the poor-law and lunacy administration, the public assistance committee, and the education authority. Coöperation was all very well in theory, but if the best practical results were to be obtained unity of command was essential. The Board of Control and the Royal Medico-Psychological Association were opposed to making medical officers of mental services part of the staff of the public health service, but their objections were not very convincing. The suggestion that such officers would not be of senior standing was without foundation. The heads of departments in Derbyshire were entirely independent clinically, and Dr. Ash was merely their administrative chief. It had been said that the administrative officer was not a mental expert, but nor was the mental expert an administrative expert. The administrative officer did not claim to be an expert in the various departments which he administered at present. The mental expert would soon find that detachment of his service would not make him independent but would bring him into subservience to a layman, probably a lawyer, as had happened under the Education Act of 1921 and the recent draft order under the Local Government Act, 1929, whereby school medical officers were placed under directors of education and poor-law medical officers were to have been made subservient to the public assistance officer. In conclusion, Dr. Ash deprecated the tendency to specialisation.

Dr. REGINALD WORTH outlined the provisions of the Local Government Act and the Mental Treatment Bill. He supposed that a general health committee for the treatment of physical and mental illness would be one of the most important branches of the public assistance committee in each county, and that mental health would require a special subcommittee to provide for the treatment of all mental disorder. Here at last was an opportunity for the treatment of the mentally sick and defective to rejoin the stream of general medicine. The centralisation of mental hygiene under one authority in a local government area was a sound policy, but its success would depend upon the administrative machinery adopted. The Royal Medico-Psychological Association had always urged that the mental hospital and mental deficiency services should not be dissociated.

The Mental Treatment Bill.

The passing of the Mental Treatment Bill was a great event; while preserving ample safeguards against wrongful interference with liberty it provided facilities that could not fail to result in widely extended early treatment which would ultimately prove preventive. The opportunity which Clause 5 afforded for early treatment was of the highest value, but the requirements introduced during the committee stage were seriously disappointing. The committee had left very little difference between "recommendation" and "certification," a most important distinction if "back-parlour" treatment was to be avoided. All that should be asked of the recommending practitioners was a declaration that the person was incapable of volition and likely to benefit by temporary treatment. Safety lay in notification and visitation, and not in any enlargement of the terms of recommendation. Altogether too much stress had been laid in the debates upon the inspection of institutions. Visitation involved much more than inspection. No doubt the effect of conversations between commissioners on the one hand, and patients, superintendents, or medical officers on the other, depended largely on the personality of the commissioner; nevertheless, his status was not unimportant, and it would be a great

pity if commissioners who were not members of the Board ceased to hold His Majesty's commission. An error which had been made in the discussions was the assumption that there would be a large reduction in the number of certified cases under care. The provision of temporary treatment was not going to reduce the number of persons ultimately requiring certification by more than 15 per cent.

Dr. W. A. POTTS agreed that mental disease and mental deficiency must be a branch of public health, but that did not mean that the two forms of mental disorder could be treated in the same institution. He could not agree that mental disease could often be attributed to a single cause. There was nearly always some psychological factor in addition to many physical factors. He thought that all child guidance clinics should ultimately be linked up with the school medical service, but in some cases it might be advisable to have an independent clinic in the first instance. If the work were to be part of the school medical service it must be carried out on a very comprehensive scale, and there were at present very few workers competent to undertake child guidance. He cordially agreed with Dr. Ash about the dangers of specialisation; nobody could deal with mental disease unless he had had a thorough all-round training, for every kind of treatment might be wanted on occasion. The narrow specialist was, as a rule, quite ineffective.

Dr. Potts described the evolution of the Hallam Hospital at West Bromwich from an ordinary poor-law hospital with one non-resident medical officer and less than 20 trained nurses, as it had been five years ago. Now it had four resident doctors and seven visiting specialists, an up-to-date theatre, a bacteriological laboratory, one of the best X ray rooms in the country, and every kind of equipment. In the old days patients entering the observation wards had almost all been certified or drafted into the house as senile dements. Last year—excluding mental defectives and senile cases over 70 years of age—49 per cent. of those admitted had been discharged improved and only 7 per cent. certified. Mental disease and mental deficiency were absolutely distinct. Mental defect was an inborn condition characterised by abnormality of the brain cells and cure was impossible; the essential treatment was training. Every case of mental disease, on the contrary, should be looked upon as curable if taken early enough. The two conditions required different types of medical officer. Medical students received an absolutely inadequate training in mental disease and none at all in mental deficiency. He had asked a number of young practitioners what they knew about mental defect; while most of them had heard of it, none of them had ever seen a case or knew anything whatever about it. To this, of course, school medical officers were an exception. Yet mental defect was on the increase and its incidence was greater than that of mental disease. It was sure to increase as long as birth control was taught to the healthy and not to the defective, the alcoholic, and the improvident.

Since the passing of the amending Act it was no longer necessary to prove the existence of mental defect from birth. It had therefore become possible to certify cases of epilepsy and encephalitis lethargica which had developed during adolescence. The serious danger thus arose of a tendency to wait until these cases became certifiable instead of treating them. There was a widespread opinion that encephalitis lethargica was not amenable to treatment because serious lesions had been found in the brain in fatal cases. It by no means followed that all cases had these lesions, and in fact encephalitis lethargica, if taken early enough, could be cured by energetic treatment. Dr. T. C. Graves had even succeeded in curing cases of five years' standing.

After a brief discussion, in which Dr. C. T. MAITLAND, Dr. T. W. HILL, and Dr. BINNIE DUNLOP took part, Dr. ASH replied

EDINBURGH OBSTETRICAL SOCIETY.

AT a meeting of this Society held on March 12th, with Dr. H. S. DAVIDSON, the President, in the chair, Dr. LEITH MURRAY (Liverpool) read a paper on

MYOMECTOMY: A RECORD OF 154 CONSECUTIVE CASES.

Myomectomy, said Dr. Murray, was not yet generally done as frequently as it should be. Conservation in gynæcology, although it could be overdone, was an excellent feature of our modern work. Women were marrying at a later age than formerly, and their uteri therefore were more likely to contain fibroids. He proposed to demonstrate statistically that: (1) numerous fibroids (the largest number he had removed was 41) could be taken from the substance of the uterus as safely as the uterus itself could be removed; and (2) after-results as regards comfort, menstrual function, and safe fertility were almost always satisfactory. Married women in the late thirties or early forties should not, he said, be submitted to hysterectomy merely because they had been sterile for years. He did not think it right to interfere in any radical way with the natural probabilities of married life even in women with several children provided that the fibroids necessitating interference could be removed with moderate ease. To broaden his survey he had included 60 cases in the non-pregnant woman,[1] of most of whom later information was available. In any statistical survey cases of myomectomy in the non-pregnant should, he said, be separated from those carried out during pregnancy. The two operations were different in character and conduct; in the former an attempt was made to remove every fibroid. Of 137 cases of fibroids operated on in the non-pregnant state fibroids of appreciable size were in each instance "dug out" of the musculature of the uterus; all intraligamentary fibroids were excluded. Neither degeneration (of any degree), nor infection (a very rare complication), was any real barrier to operation. In the operation itself he laid special stress on hæmostasis. Mechanical or elastic clamps were unnecessary and there was no need to reduce the resulting uterine mass by trimming or excision; involution occurred just as well and as quickly without. Examination at the end of three months showed that the uterus was normal in size and shape whatever its outline was at the end of operation. He recommended exploration of the uterine cavity in all cases where hæmorrhage was a symptom.

Dealing with a series of 137 cases of myomectomy in the non-pregnant, for three and a half years, ending December, 1929, he had, said Dr. Murray, carried out 1 myomectomy to 2·8 hysterectomies for fibroids; for the preceding two and a half years the relationship had been 1 to 3·7. Only one case had ended fatally by embolism (0·73 per cent.), whereas his mortality for hysterectomy for fibroids was 1·5 per cent. Two cases of recurrence had been observed and in one of these the uterine cavity, which four years later contained a fibroid polyp, had been explored at the original operation. Of the first series of 60 cases, 35 women under the age of 42 had had a reasonable chance of pregnancy, and of these 34·3 per cent. had had one or more pregnancies since the operation. The latter series of 77 cases had already produced, in 49 possible cases, 22·4 per cent. of pregnancies. For the total of 137 cases up to the end of 1929 the proportion of pregnancies was over 27 per cent. Many cases of acute necrobiotic degeneration could, he thought, be tided over the danger period by repeated doses of morphia.

Of ten cases operated on during pregnancy, six went to full term or viability, three miscarried within 24 hours—probably inevitably—and one died as the result of an injudicious operation carried out on a diabetic. Five cases associated with a diagnosis of intra-uterine death (three, strangely enough, proving to be hydatid moles) all did well, and two of

[1] Jour. Obst. and Gyn., 1926, xxxiii., No. 2.

them had a further pregnancy. Of two cases at full term with irreducible obstruction, one case was easily delivered, by Cæsarean section, of a living child, and four fibroids, the largest a red intramural fibroid the size of a fist, was removed. The other died of a low-grade peritonitis, six days after a Cæsarean section with an extensive myomectomy; the latter did not appear to have contributed to the fatal result.

Dr. Murray concluded by reaffirming his opinion, expressed in 1925, that myomectomy was an operation of less difficulty and danger than was supposed, was available in a large percentage of cases of women of child-bearing age, and should in such circumstances be preferred to hysterectomy.

Diagnosis of Pregnancy.

Dr. Edwin Robertson read a paper based on the work of the pregnancy diagnosis station at the University Department of Animal Genetics. The Aschheim-Zondek test is simple, involving only injection of mice with urine, and later a naked-eye examination for the presence of blood-filled follicles in the ovaries—the *Blut-punkt* of Aschheim and Zondek. Microscopic examination of the ovaries shows that the action of the pregnancy urine is one of maturation. The comparatively massive dosage used in the test probably deranges the maturation processes involved, thus producing the atypical hæmorrhages seen in the follicles. The ovary-stimulating factors in the pregnancy urine are similar to the ovary-stimulating factors which can be extracted from the placenta, not only in the type of reaction produced in the ovary—i.e., maturation—but also in being destroyed, precipitated, and dissolved by the same agents. Therefore the active substances in the urine are probably only products of the placenta excreted for some reason as yet undefined. Hence a positive test is a placental sign and means, at least, the presence of placental elements. Now the function of the ovary depends upon extra-ovarian factors which are for the most part situated in the anterior lobe of the pituitary, and it has been shown that the ovary-stimulating powers of the placenta are similar to those of the anterior lobe of the pituitary. Wiesner has explained this mutual relationship in a most convincing way. "The internal secretion of the ovary is necessary for the inception and maintenance of the conditions of pregnancy, and the stimulus of the placental hormones is required for the continuation of the ovarian function beyond the initial phase which occurs under pituitary influence." This particular rôle of the pituitary and the activity of the placenta are reflected in the urine of pregnancy; urine which will produce ovarian maturation is therefore probably from a pregnancy.

Of the total 907 tests hitherto made, 479 have been controlled and found correct. Of these, 288 were positive and 179 were negative. Thirteen additional cases were labelled incorrect, but four of these were so designated through a misinterpretation of the test result by the clinician. Nine incorrect results out of 479 tests gives a 98 per cent. degree of accuracy. The test is also useful in detecting the presence of active placental elements and also hydatidiform mole and chorion epithelioma. Incomplete abortions, ectopic pregnancies, missed abortions, and cases of retained placenta have all conformed to the rule that if the elements present are alive and active then a positive result will be obtained and vice versa. It is thought that both hydatidiform mole and chorion epithelioma are extremely active in the production of the ovary-stimulating substances and that the presence of lutein cysts in association with these conditions is strong evidence in favour of this view.

Lysozyme.—Dr. D. Nabarro writes that in his remarks made at the meeting of the Medical Society for the Study of Venereal Diseases (THE LANCET, April 5th, p. 753) it was not Mr. Percy Flemming to whom he referred as having discovered and named the material now known as lysozyme, but Mr. Alexander Fleming of St. Mary's Hospital. It was Prof. Rominger, of the Children's Hospital at Kiel, who was quoted as favouring injections of sterilised milk.

Reviews and Notices of Books.

SURGICAL DIAGNOSIS.

By American Authors. Edited by EVARTS AMBROSE GRAHAM, A.B., M.D. Bixby Professor of Surgery, School of Medicine, Washington University, St. Louis. London: W. B. Saunders Company, Ltd. 1930. In three volumes. £7 10*s.* per set. Vol. I. Pp. 919. Vol. II. Pp. 871.

THIS work, of which two volumes have been issued, promises to be a credit to American surgery. Though the title of "Surgical Diagnosis" might have excused a somewhat narrow outlook, the editor has wisely interpreted his task in a broad sense. The articles in the first two volumes deal with ætiology, pathology, and to some extent with treatment in so far as they illuminate diagnosis, and while due stress is laid on the clinical aspects, laboratory methods are not neglected. The list of distinguished surgeons who contribute to the work prepares the reader for a surgical feast, and his expectations are realised. The first volume is devoted to the consideration of wounds, infections, post-operative complications, diseases and injuries of the vessels, bones, muscles, fasciæ, and tendons, including fractures and dislocations, and so is in considerable part orthopædic in character. The two major sections are by Dr. Leroy Charles Abbott and by Dr. John Albert Key. Both are excellent; that by Dr. Abbott provides a résumé of orthopædic surgery which could hardly be bettered, either in clarity of exposition or inclusiveness. The section on fractures, while admirably serving its purpose, suffers from the necessary omission of those questions of treatment which constitute the more fascinating aspects of this branch of surgery. The article on diagnosis of joint disease and injury by Dr. Nathaniel Allison deals with a very difficult subject clearly and concisely, while the name of Dr. Kanavel as joint author of the section on infections of the hand is sufficient guarantee of its quality. The illustrations throughout this volume are excellent, with the possible exception of some of the X rays of abnormal conditions of the spine; some skilful retouching of the negatives would have improved the teaching value of these.

The second volume opens with a chapter on gynæcological diagnosis, and this is followed by sections on the skin, face, neck, and thyroid, the alimentary canal from stomach to colon, with sections on the spleen, on hernia, and on acute abdominal emergencies. The chapter on gynæcology suffers from compression. The diagram of air distension of the tubes produced as Fig. 576 is hardly worth a further reproduction as Fig. 589. No reference in the text is made to the illustration of radium therapy (Fig. 540), and it is hardly good enough to justify its inclusion. On the other hand, a few more illustrations would have been helpful in the section on the face and jaws, particularly in regard to diseases of the tongue. The same criticism applies to the chapter on diseases of the neck which is entirely unillustrated. The alimentary canal receives clear and careful treatment, but it seems unfortunate that the sections on liver, gall-bladder, and pancreas, which presumably are relegated to Vol. III., could not have been discussed with the remainder of the digestive tract.

While congratulating Dr. Graham on the way he has carried out his editorial duties, we would make two suggestions. The first is that his own bracketed comments or interpolations, valuable as they are, would be better incorporated in the article by agreement with his contributor. The second is that the bibliographies at the end of each section should be rearranged on a uniform plan, to include the quoted authorities in the text, the unnumbered lists of papers and the references in foot-notes.

These volumes are in themselves a fine achievement, and will make all those who come across them eager to possess the completed work.

DISEASES OF THE EYE.

Sixth edition. By Sir JOHN HERBERT PARSONS, C.B.E., D.Sc., F.R.C.S., F.R.S., Ophthalmic Surgeon, University College Hospital; Surgeon, Royal London (Moorfields) Ophthalmic Hospital. London: J. and A. Churchill. 1930. With 21 plates and 348 text-figures. Pp. 678. 18*s*.

THIS text-book from the pen of an acknowledged authority can be safely recommended to students and practitioners. Though recent advances are incorporated the author limits his book to practically its former size. The slit lamp, although it has produced no revolution in ophthalmology, has already proved itself of service in practical diagnosis, and a new diagram shows how the minute structure of the lens can be illuminated by this lamp. Another diagram shows how a foreign body in the cornea can be exactly located with its help. The importance of the presence of solid particles in the aqueous which could not be detected without the slit lamp is also stressed. Other useful additions are diagrams explaining "Rönne's step" in the perimetric diagnosis of glaucoma, a figure showing senile marginal atrophy of the cornea, and several figures taken from drawings or photographs of the late Mr. Coats (for years pathologist to Moorfields) illustrating retinal vascular degenerations and the atrophic nerve in tabetic optic atrophy. The account of the treatment of wounds of the cornea and sclera is somewhat fuller than before.

PRACTICAL PSYCHOLOGY AND PSYCHIATRY.

Sixth edition. By C. B. BURR, M.D., late Medical Director, Oak Grove Hospital, Flint, Mich. Philadelphia: F. A. Davis Company. 1930. Pp. 378. $2.75.

THIS small book is evidently written by an experienced psychiatrist, whose psychology is of a practical sort. The opening chapter, which is mainly a free paraphrase of Bertrand Russell, will not appeal to the English reader, but after skipping this he will find the rest well arranged, adequate while avoiding unnecessary elaboration, and full of sound practical advice. The psychology is that of the old "faculty" brand, but is clearly put and well related to the disorders of the faculties occurring in mental disease. The chapter on aberrations in the sphere of sex is curious in its selection of material and fails to mention masturbation at all. In that on definition and causes of insanity the author leans to the physiogenic and ignores the psychogenic side; he includes vicious habits as causing 25 per cent. of cases, whereas most people would regard these as results of the disorder of mind. The descriptions of syndromes are excellent; occasional trifles may arouse critical comment—e.g., the suggestion that dementia præcox may be caused by typhoid, and reference to the "syphilitic bacillus"; nor would most people regard adolescence as the period from 25–35 years of age. The assertion that "paranoia and pellagrous insanity" are mental defects from congenital causes or arrest of development in infancy must surely be an error of proof-reading, some transposition of matter having doubtless occurred. The chapter on management of insanity from a medical standpoint is sound, practical, and reliable; that from the nursing standpoint excellent as to general principles; while the final sections on mental hygiene, though brief, emphasise all essential points.

The author prefaces the book on the title page as being "for use in training schools for attendants and nurses and in medical classes, and as a ready reference for the practitioner." In this country we should consider it too theoretical to be more than an interesting addendum to a handbook for training nurses; the medical student will find it valuable illumination for his course in psychological medicine; but it is the general practitioner and the newly joined junior medical officer in a mental hospital who will appreciate it to the full. To complete the information required by these readers a chapter on legal matters and procedure for certification or other conditions required by American law in the management and care of mental patients might be added.

NOTABLE BRITISH TRIALS.

The Trial of Browne and Kennedy. Edited by W. TEIGNMOUTH SHORE. London: W. Hodge and Co. 1930. Pp. 218. 10*s*. 6*d*.

Browne and Kennedy were hanged two years ago for the murder of Police Constable Gutteridge. The chief legal interest lay in the question whether the two should be tried jointly or separately. This is a question for the discretion of the judge at trial; if he exercises his discretion judicially and no injustice results, no other court will interfere. As usual the Court of Criminal Appeal had no ground for criticising the handling of the case by so experienced a judge as Mr. Justice Avory. Kennedy had incriminated Browne in a remarkably full statement to the police. Joint trial could be said to have embarrassed the defence. When this point was taken on appeal against their conviction, the Lord Chief Justice ridiculed the doctrine that, if two persons of bad character commit a crime together, they must never be tried jointly because the character of one may hurt the other. The trial is devoid of medical interest save for the fact that the murder was committed while the criminals were in possession of a motor-car stolen from a doctor's garage. The car had contained certain medical appliances, subsequently discovered in Browne's premises; his explanation of how he came by them was unconvincing. The murderers carelessly left a spent cartridge case in the car when they abandoned it a few hours after the theft. The gunsmith's evidence identified the pistol which had fired the shot. Apart from this important advance in detective science, the trial was scarcely more notable than any other trial for murder.

Browne and Kennedy carried firearms, intending to use them to avoid capture. They shot the constable dead while doing his duty; further shots were callously fired into his eyes. Had these outlaws not been brought to justice there would have been great public uneasiness. Could a referendum have been taken on the question whether their punishment should be death or a long term of imprisonment, it might have revealed strong support for the retention of capital punishment.

BLOOD GROUPING IN RELATION TO CLINICAL MEDICINE.

By LAURENCE H. SNYDER, Sc.D., Associate Professor of Zoology, North Carolina State College, Raleigh, N.C. London: Baillière, Tindall and Cox. 1929. Pp. 153. 22*s*. 6*d*.

THIS book represents the only attempt in the English language to envisage the present state of knowledge in regard to the bloo groups. It contains little that is entirely new, but is of value in that it brings together for the first time in English a large number of facts until now only available in scattered articles in various journals, many of them in foreign languages. Nothing appears to have escaped the author and the bibliography is monumental. In common with most recent workers on the subject he regards it as practically established that the whole constitution of the blood groups can be explained by the postulation of the original agglutinogens A and B of von Dungern and Hirschfeld; the description of the various agglutinogens which filled the literature on the subject a year or so back he regards as having had their roots in errors of technique. He regards the view of Bernstein on the inheritance of the groups (based on the conception of the triple allelomorphism of the dominants A and B and the recessive O) as adequate to meet all the

requirements of the situation as at present known. All the author's own observations on the subject, and they are numerous, are in conformance with this hypothesis. Chapters IX., X., and XI., dealing with the inheritance of the groups, are particularly valuable.

JOURNALS.

JOURNAL OF PATHOLOGY AND BACTERIOLOGY. Vol. XXXIII. No. 2. Pp. 233–495. April, 1930.—The number is dedicated to Prof. W. H. Welch, an honorary member of the Pathological Society of Great Britain and Ireland, on the occasion of his eightieth birthday on April 8th, 1930.—Primary Malignant Intrathoracic Tumours, by J. Maxwell (London). Of 239 tumours at St. Bartholomew's Hospital, 184 were primary bronchial carcinomata; it is suggested that the oval-celled carcinoma arises from the basal layers of the mucosa. Some of the mediastinal tumours are sarcomata arising in lymphatic glands.—An Embryonic Tumour of the Liver containing Striated Muscle, by H. L. Sheehan (Manchester). In a girl of six the liver contained a number of papilliferous cysts, one of which became malignant.—An Unusual Case of Diffuse Tuberculous Infiltration of the Myocardium, by J. G. Thomson (Aberdeen).—Antivaccinal Serum: Evidence for Slow Union with Virus in vitro, by C. H. Andrewes (London). In the body the antibody of antivaccinal serum is effective almost at once in preventing the effect of virus; in vitro the virus is neutralised only after several days.—Specific Antibody Absorption by the Viruses of Vaccinia and Herpes, by W. Smith (London). The viruses absorb their corresponding antibodies.—Multiple Malignant Neoplasms, by J. W. Orr (London). In 7207 autopsies, 1046 of which showed malignant disease, there were eight in which two independent malignant tumours were present. There is no evidence that one tumour has any influence on the development of another.—Fatal Granulomatosis of the Central Nervous System due to a Yeast (Torula), by F. B. Smith (Harrogate) and J. S. Crawford (Ilkley). A woman of 31 with generalised blastomycosis, the lesions apart from the nervous system being inconspicuous.—Invasion of Epidermis by Carcinoma, by J. S. Dunn (Manchester). A mucinous carcinoma at the anus growing into the epidermis and resembling Paget's disease of the nipple.—Tissue Culture in the Study of Immunity to Herpes, by C. H. Andrewes (London). Herpes virus multiplies and forms inclusive bodies in tissue cultures of rabbit testis and may be carried on through serial cultures. It grows equally well in tissue cultures made from the testes of immunised rabbits. Immune serum prevents infection of the cells but has no influence after infection has occurred.—The Inheritance of the Blood Group Factors, by G. K. Kirwan-Taylor (London). The examination of 250 fathers, mothers, and babies supports Bernstein's theory that there are three allelomorphs, A, B, and O.—Two Cases of Fœtal Rickets, by J. Preston Maxwell (Peking). Two clear cases in children born from mothers with severe and untreated osteomalacia. H. M. Turnbull (London) reports that the bones of one of the cases show the changes of rickets combined with those of Barlow's disease.—The Rôle of the Spleen in the Production of Antibodies, by W. W. C. Topley (London). Experiments suggesting that the spleen is concerned in the elaboration of antibody or of some precursor.—The Toxicity of Irradiated Ergosterol, by J. B. Duguid, M. M. Duggan, and J. Gough (Cardiff). Large doses do not produce loss of weight, arterial calcification, &c., if the rats are fed on an ordinary mixed diet; positive results are obtained with a synthetic diet rich in calcium.—Epithelial Proliferation in the Lung of the Rabbit brought about by Intrapleural Injection of Solutions of Electrolytes, by J. S. Young (Leeds). The reaction to salts is determined almost exclusively by the cation. Trivalent metals are more effective than divalent and these than monovalent. Among the heavy metals capacity of cause cell growth is inversely proportional to solution pressure.—Spinal Metastases in a Case of Cerebral Glioma of the Type known as Astrocytoma Fibrillare, by D. S. Russell and H. Cairns (London). Pin-head metastases in the subarachnoid space.—The Genus *Willia*, by J. F. D. Shrewsbury (Birmingham). A systematic account of three species of this genus of yeasts.—A Transplantable Melanoma of the Mouse, by H. E. Harding (London), and R. D. Passey (Leeds). Arose in skin of ear. A large proportion of the cells in the tumour are extraneous phagocytes stuffed with melanin.—Intravitam and Supravital Staining: the Cellular Reactions following Mild Irritation of the Peritoneum, by D. F. Cappell (Glasgow). Consult the original for details.—Acute Disseminated Encephalomyelitis as a Sequel to "Influenza," by J. G. Greenfield (London). Two cases following vague febrile attacks, one fatal in five days, the other in seven weeks. The perivascular demyelination and other lesions are of the same type as those found in the encephalitis which sometimes follows small-pox vaccination or measles. This "post-vaccinal encephalitis" is a disease per se.—Experimental Vaccinal Encephalitis in the Monkey and the Rabbit with Special Reference to the Problem of Encephalitis following Vaccination in Man, by E. W. Hurst and R. W. Fairbrother (London). The essential lesion of experimental infection of the brain with vaccinia virus is a fibrinous hæmorrhagic and polymorphonuclear meningitis, completely different from post-vaccinal encephalitis.—The Reaction of the Central Nervous System to Vaccinia Virus by J. McIntosh and R. W. Scarff (London). The lesions produced in the brains of rabbits by virulent strains of vaccinia virus are essentially the same as those found in post-vaccinal encephalitis in man.—A Primary Carcinoma of the Kidney, by I. Gray (Aberdeen). Diffusely infiltrating the organ.—A Specimen of Implantation of Secondary Carcinoma within the Intestines, by J. H. Teacher (Glasgow). About a hundred small tumours of spheroidal-celled carcinoma in the loose areolar tissue of the submucosa of the small intestine, probably from a carcinoma of gall-bladder.—The Gonococcal Complement-fixation Test: Improvements in Technique, by I. N. O. Price (London). Gonococci dissolved in alkali and precipitated by alcohol yield a good preparation by which the time taken by the test can be materially reduced.

Reports and Analytical Records.

CHELTOVA TONIC FOOD BEVERAGE.

(CHELTINE FOODS CO., CHELTENHAM.)

THIS food, which is of a light chocolate colour, is prepared for use by mixing two spoonfuls to a breakfast cup with hot milk and sweetening according to taste. It is intended for occasional or regular use, and it may be regarded as an appropriately balanced food material. It claims to be rich in vitamins A, B, and D, and to contain C. On analysis the following results were obtained:—

	Per cent.
Carbohydrates	59·51
Fat	12·47
Protein	17·50
Mineral matter	5·06
Moisture	5·46

The carbohydrates are derived, inter alia, from germinated grain and from cocoa; there is no evidence that starch other than that natural to the cocoa is present. The mineral matter contains 0·41 per cent. of phosphorus (P_2O_5) and 0·4 per cent. of iron in a soluble state. Lecithin and an active diastase are also present.

THE LANCET.

LONDON: SATURDAY, APRIL 19, 1930.

POST-GRADUATE MEDICAL EDUCATION.

LAST week there was published by the Ministry of Health a document of the highest significance in the cause of medical education, and one, moreover, which indicates that a course advocated, and often vehemently demanded, for the past 20 years, is now to be taken. A central scheme of post-graduate education in London has passed from the stage of hope to that of accomplishment, and when the movement took place it took place quickly. A committee appointed in the year 1925 by Mr. NEVILLE CHAMBERLAIN, then Minister of Health, "to draw up a practical scheme of post-graduate medical education centred in London," have made their Report, and the recommendations are both unanimous and eminently workable. We summarise this Report briefly elsewhere, and it should be noted that immediately upon its appearance an announcement was made on the part of the Ministry of Health accepting the findings of the committee. For Mr. GREENWOOD said that the Government, in agreement with the views of the committee, would grant £250,000 for building and equipping a medical school as an integral part of a post-graduate centre in London, to be placed at the Hammersmith Hospital, Wormwood Scrubs. This hospital of 400 beds became the property of the London County Council at the beginning of this month, under the terms of the Local Government Act; the Council's coöperation in the development of the scheme may be relied upon, as may that of the University of London.

The necessity of providing post-graduate medical education in London has been insisted upon for years wherever and whenever medical education has been under discussion, but active work to secure that end, though for long in motion, has had little material result, however fair the early promises. Hence to many who have had the cause of medical education at heart it may seem almost incredible that a plan has arrived, ready for working, under which obstacles, hitherto fatal to anything like a general scheme of London post-graduate teaching, have suddenly faded away. The early work of JONATHAN HUTCHINSON and the Medical Graduates' Clinic, the later activities of the Fellowship of Medicine, subsequently amalgamated with the Post-Graduate Medical Association, have all appeared fruitless because, for this sound reason or that, a centre at which was provided even the minimum of what was necessary could not be established. But these pioneer efforts have had their part in bringing about the position which has now been reached, and this should be a source of gratification to many who hitherto have experienced only disappointment in their various efforts. The initial step forward was taken when Dr. CHRISTOPHER ADDISON, the first Minister of Health, set up the Post-Graduate Medical Committee, which sat under Lord Athlone, and issued a report some nine years ago. This was a strong committee, and its appointment was an official recognition of the fact, over and over again insisted upon by those in whose hands the conduct of medical practice lay, that the sound medical curriculum which we possess—this no one denying—needs in these days post-graduate additions, revisions, and refurbishings, if it is to play its due part in the maintenance of national health. It had been seen that in the conduct of medical practice post-graduate education will soon become an integral part, as was indicated by the growing habit of taking study leave; and while post-graduate classes became recognised as a necessity for officers in the Services, those familiar with the working of medical practices at home knew that the family practitioner needed opportunities for supplementing his scientific equipment every bit as much as his colleagues directly in the service of the State. The findings of the Athlone Committee were in no sense a revelation, when the committee put on record the outstanding needs, first, for the establishment in London of a central school of hygiene, and, secondly, for a post-graduate hospital with a medical school attached. Such were the conclusions of those who had taken part already in long discussions on various aspects of the question, and who gave evidence, many of them, before the Athlone Committee. But, alas, the conclusions of these debates always appeared to demand the unattainable; and now, suddenly, both needs have been met. For since the issue of the Athlone report the London School of Hygiene and Tropical Medicine has been established, while more recent legislation has made possible the acquisition of a general hospital to be applied with an attached school, to post-graduate needs. During the long years of discussion it came to be generally admitted that no progress in a post-graduate scheme of medical education for London would ever be made until a hospital with a sufficient number of beds could be obtained to which a medical school could be attached, where training could be given fitted to the needs of the graduate, since graduate and undergraduate medical teaching cannot be made to run hand in hand at the same institution. The hospital has been found, and so have the means for its proper development and adaptation.

Thus far very good, but much cause for thought remains; there is need for definition of the scope of the work ahead if just judgments are to be formed of the policy that may ensue in respect of many things. For example, the selection of the officiate is going to exercise many minds. Post-graduate education is a term that covers much, especially when the efforts represent what a Nation with wide possessions feels moved to do in its Metropolis. Post-graduate education is needed as much by the family practitioner as by the officer in the Services, and as much by those at home as those abroad; while, with every desire that London should take a rightful place as an international centre of medicine, we must not wish to depend either on the goodwill or on the fees of strangers for the success of a new London post-graduate school. Hence it is a varied clientèle whom the school should serve, and serve equally well, and proportionately to the different demands on its activities and resources. Instruction, therefore, of very different sorts may be needed, and a personnel of very different sorts may be looked for in the teaching staff. A salary that could reasonably be offered to a good teacher along certain lines of post-graduate training could not be offered to another and more widely known man, and though the latter would be the teacher whom some of the adherents to the school would expect to hear, he might none the less be but ill-fitted for an educational appointment. Perhaps a rota of teachers of the needed learning and variety might be obtained from the undergraduate teaching centres; the obstacles here are obvious, but need they be unsurmountable?

This is but an example of the matters which remain to be dealt with. They are details, and only details by comparison with the arrival of a great central scheme, but there will be room in their adjustment for the display of adequate leadership, and it is not too soon to give them consideration.

PULMONARY ASBESTOSIS.

THE introduction of that extremely useful substance asbestos into industry has unfortunately given rise to a new occupational risk and to yet another form of chronic pulmonary fibrosis. The material has in one form or another been known since the days of Greek and Roman civilisation—the ancient writers refer to it as "unquenchable stone"—and CHARLEMAGNE is said to have had a table-cloth made of it, which was cleansed by throwing it in the fire. In earlier days the hornblende variety of asbestos was often referred to as amianthus. Sir THOMAS BROWNE, the author of Religio Medici, in one of his poems sighs that he might have amiantine toes which would not suffer from the gout. The indestructibility of asbestos has no doubt been the primary reason for its introduction into trade processes; asbestos will resist great heat, strong acids, and alkalis, whilst owing to its fibrous structure certain varieties of it can be carded and spun like a textile. A report[1] just published by the Home Office deals with the effects of asbestos dust on the lungs and on the dust suppression in the asbestos industry, and is written by Dr. E. R. A. MEREWETHER and Mr. C. W. PRICE, respectively medical and engineering inspector of factories. Dr. MEREWETHER'S report is based upon data obtained in an extensive investigation made during 1928 and 1929, initiated by the Home Office, following the discovery of non-tuberculous fibrosis in the lungs of an asbestos worker, of sufficient severity to necessitate treatment in hospital. Prior to this the Home Office had knowledge of only two deaths in which the inhalation of asbestos dust was a contributory cause; a survey of the industry in 1910–11 had not revealed any serious hazard. The well-known triad—exposure to dust, fibrosis of the lungs, and high mortality-rate from pulmonary tuberculosis—has long been recognised in industrial processes involving the use of free crystalline silica, but, as Dr. MEREWETHER remarks, the fact that a serious, even fatal, degree of fibrosis can be produced by other dusts has not been generally appreciated. A peculiar feature of the fibrosis produced by asbestos dust is the occurrence in the sputum or lung-juice of bodies, described by Prof. MATTHEW STEWART, which have a curious resemblance to a minute crustacean.[2] These consist, as BURTON WOOD and GLOYNE have shown, of a series of discs around a central spicule of asbestos.

The manufacturing processes fall into one of two groups according as they employ (more or less) pure asbestos and asbestos along with other dusty substances. The former group has been the subject of this inquiry on the ground that the effect of asbestos dust alone must be worked out before the complicated factors can be assessed. The population at risk in this group of the industry is not exactly known, but is estimated at 2200. A certain amount of selection was used in the examination, new-comers and long-time workers being chosen. The men examined were with one exception at work on the day of examination; their number (excluding 11 cases who had previously worked in other dusty occupations) was 363, or 16·5 per cent., of the estimated total workers in the industry. Of these, 95 (or 26·2 per cent.) showed a diffuse fibrosis of the lungs attributable to the inhalation of dust; 21 others had precursive signs of the disease. In 133 cases radiograms were made; 62 of these showed definite diffuse fibrosis, 25 were only suggestive. Dr. MEREWETHER is careful to emphasise the fact that only a proportion of the workers have been examined and that it would be unfair to assume that roughly 1 in 4 asbestos workers have fibrosis; the group examined was loaded with a high proportion of men who had been five years or more in the industry. The actual figures were these. There were no cases of fibrosis among those who had been employed less than 4 years, 36 cases in those employed from 5–9 years, 27 cases in those employed 10–14 years, 15 cases in those employed 15–19 years, and 17 cases in those employed over 20 years. Considering the relation of fibrosis to age the largest number of cases were found in the age-groups 30–39 and 40–49; Dr. MEREWETHER deduces that the important factor is the length of exposure, and that the age factor is negligible. The difficulties in ascertaining the incidence of fibrosis amongst workers in particular processes seem insurmountable as many processes are housed in one room and workers are transferred from one process to another. But there is clearly a lower incidence and probably a later onset among the spinners as a group than among those who crush, card, or weave asbestos. No evidence was found to indicate that one variety of asbestos is more potent than another in producing fibrosis. Concentration of dust and length of exposure are interdependent factors. For a number of years disablement, it seems, is curiously slight, even more so than in the case of silicosis. This may be due in part to the character of the disease, and in part to the fact that the work is not as a rule strenuous. The affected worker often continues at work with occasional breakdowns from bronchitis until he his aware of shortness of breath upon exertion. A terminal broncho-pneumonia or other acute infection may supervene while the man is still at work; with others there may be a period of invalidism. Particulars are given of ten cases up to the end of 1929 in which an advanced degree of abestosis without tuberculosis was the primary cause of death, nine being verified post mortem. The length of exposure in these cases varied from 9 to 24 years. The rate of progress seems to vary within wide limits. With continued exposure to high concentrations of dust the fibrosis may be fully developed in from seven to nine years; with a lesser the fibrosis may take 15 to 25 years to mature. So far as the available data go there is no special liability to pulmonary tuberculosis amongst asbestos workers.

Preventive measures are dealt with by Mr. C. W. PRICE in the second part of the report. The factories and workshops concerned number at least 160, of which 18 are textile factories. Small premises are the rule. The majority are well-housed and well-ventilated, but there are some open-sided sheds which are difficult to keep clean, and some which are congested with material. The arrangements for ventilation vary much. Dust removal systems where used effect a measure of general ventilation; over-head extracting fans are unsuitable and little used. Extraction by downward displacement has been considered for weaving rooms and Mr. PRICE considers it might, with suitable safeguards, replace the localised exhaust ventilation, although it could not be successful without efficient heating. While very dusty processes are already recognised, he points out

[1] H.M. Stationery Office. Pp. 34. 1*s.* 3*d.*
[2] THE LANCET, March 1st, p. 445, and March 29th, p. 701.

that in processes such as spinning and weaving, in which in other textile trades special methods for dust control are not required, precautions must also be taken in asbestos works. The manufacturers are clearly confronted with the necessity of attaining conditions which will ensure much less dust in the atmosphere than can be tolerated safely in comparable trades not using asbestos. The recommendations in the report include the application of efficient localised exhaust ventilation at dust-producing points; the substitution of enclosed mechanical methods for hand conveyance, and for dusty handwork generally; the effective enclosure of dust-producing machines and plant; and the substitution of wet methods for dry. Young persons should be excluded entirely from specially dusty work.

STATE MEDICAL SERVICE.

THE objects of the State Medical Service Association have been revived in the National Medical Service Association, the constitution of which was adopted last week at a meeting held at the House of Commons by invitation of three medical Members—namely, Mr. SOMERVILLE HASTINGS, Dr. ALFRED SALTER, and Dr. ETHEL BENTHAM. Membership of the new Association is to be open to all registered medical men and women and dentists, to registered medical and dental students, and to others who are in sympathy with its objects. The primary aim is to advocate and make clear to the medical profession and to the public the advantages of a national medical service, and for this purpose it will hold public meetings, publish and circulate literature, and otherwise promulgate its cause. The Association will also take steps to promote and secure legislation giving effect to its objects. In a footnote to the constitution it is stated that a national medical service should include the establishment of a medical service available to all members of the community and providing every necessary form of medical, surgical, obstetrical, dental, and preventive treatment, coördinated as one service under the Ministry of Health. It will be recalled that these were substantially the aims of the State Medical Service Association founded in 1912 with the late Prof. BENJAMIN MOORE, F.R.S., as president, Dr. JANE WALKER as hon. treasurer, and Mr. CHARLES A. PARKER as hon. secretary, the activities of which were overshadowed by the coming of the war. This Association was founded because its promoters felt that the time had come for freeing a large section of medical men and women from the distasteful and incongruous task of assessing and collecting fees for services rendered; in its stead they should be guaranteed an adequate and certain salary during their active years of service, coupled with a system of gradual promotion and followed by a generous pension. Under such a scheme the present hospital system would be placed, it was urged, on a firm financial basis, hospital staffs being properly remunerated and hospital doors opened to all sections of the community. The scheme was frankly described as the organisation of the medical profession as a branch of the nation's civil service. The new Association has, we understand, as yet gone little beyond the drafting of its constitution and acceptance of the principle that an efficient medical service can only be built up if the doctors who are serving in it are allowed a large say in the conditions of service. Its promoters feel that the time has come for the State to accept responsibility not only for certain special affections such as tuberculosis and venereal disease, but for the provision of efficient treatment for all who require it. There is, however, nothing of the reforming bigot about them, and there is no suggestion of placing all doctors under Government control while improving, from the public point of view, the medical activities of the State.

Annotations.

"Ne quid nimis."

PATENTS FOR FINE CHEMICALS.

IN summarising the report of the British Science Guild on the British patents system, we commented on it from the point of view of the medical inventor.[1] In a recent address to the Society of Chemical Industry[2] Mr. F. L. Pyman speaks from the point of view of the manufacturer. He points out that chemical firms incur enormous expenditure when they undertake the research which leads to the preparation of new or improved substances. It is not unreasonable for them to expect a temporary monopoly of the drugs which are discovered through their enterprise. In the absence of a monopoly they have little incentive to market the product. Dakin's solution, for instance, is a valuable antiseptic which is little advertised simply because it was not patented and can be manufactured by anybody. Supposing that a manufacturer prepares all the many possible derivatives of a certain drug which has purgative properties, and eventually finds one which is an efficient purge and is at the same time free from objectionable actions. If he puts this substance on the market under a registered name—the "something brand" of the drug—other manufacturers will speedily market it as the "something else brand." If he sells it disguised as a constituent of an undeclared mixture the medical profession will be prejudiced against it. The only other course open to him is to keep his knowledge to himself and try to find some allied substance with a similar action "new" enough to be patented. Obviously, Mr. Pyman concludes, an adequate system of monopoly patents is essential to the manufacturer as an incentive to research, to the marketing of products, and to the disclosure of processes.

Mr. Pyman welcomes the proposals of the British Science Guild as a means of protecting "biological" products without infringing the ethical code of the medical profession, but is not at all so sure of their value for "chemical" drugs. "Dedicated" patents might well protect such inventions as "quinanil" and thyroxin, but a patent is in effect a reward for disclosure, and the manufacturer cannot be expected to disclaim the reward in the way that the medical research worker is expected to do. If the manufacturer cannot patent the fruits of his enterprise in endowing research he will try to keep his processes secret. Mr. Pyman instances the case of histamine, the activity of which was demonstrated in 1910. Soon afterwards Mr. Pyman devised a new and improved synthesis which was patented by Mr. Wellcome and himself. If the employing firm had been able to obtain only a patent which they could not control they would have had no inducement to allow Mr. Pyman to publish his method, and he feels that the result of substituting "dedicated" for monopoly patents will be to restrain the patenting of improved processes for the manufacture of known compounds, and consequently to hinder the publication of scientific work. Moreover, as he points out, chemical inventions often proceed step by step, and the manufacturer who cannot obtain a monopoly for his drug will endeavour to protect some intermediate product essential for its synthesis. He advises all interested parties to scrutinise very carefully the proposed changes in the patent system before they are allowed to pass into law.

[1] THE LANCET, March 29th, 1930, pp. 698, 718.
[2] Jour. Soc. Chem. Industry, March 21st, 1930, p. 151.

OPHTHALMOLOGY IN EGYPT.

THE third annual report of the Giza Memorial Ophthalmic Laboratory, recently published, contains, in addition to a summary of the work for the year 1928, a brief account of the laboratory itself. It was founded as a memorial to the men of the Egyptian Labour Corps and Camel Transport Corps who gave their lives while serving with the armies of the British Empire during the Great War. The funds for its erection were voted in 1921 by the Imperial War Graves Commission in London, and with the approval of the Egyptian authorities, the scheme of Mr. A. F. MacCallan, at that time Director of the Ophthalmic Section of the Department of Public Health, was adopted, for the erection of a laboratory for pathological study and research in connexion with diseases of the eye. The Egyptian Government having granted a further sum for equipment, the laboratory was opened in 1925 on part of the site given by the Egyptian Government for a new Ophthalmic Hospital at Giza, which was itself opened in 1926, since when the two institutions have worked side by side, it being arranged that the Director of the Laboratory should be a European ophthalmic surgeon who should also be an honorary surgeon in the adjoining ophthalmic hospital, and that he should be assisted by a European pathologist and two Egyptian doctors specially trained in ophthalmology. The report, written by the Director, Mr. Rowland P. Wilson, of the work done in 1928 includes accounts of clinical and pathological cases of interest, and is well illustrated. Much attention is devoted to trachoma which affects as many as 90 per cent. of the Egyptian population, but no new light is thrown on its pathogenesis. The results of different methods of treatment, both of trachoma and of acute purulent ophthalmia, are compared; injections of milk appeared materially to shorten the duration of the acute stage. Both in this publication and in the *Bulletin* of the Ophthalmological Society of Egypt for 1929 the value of subconjunctival injections of phenolaine in the treatment of corneal nebulæ is spoken of, a method first employed in India by V. Nesfield. A number of cases of proptosis from tumour and other causes are also described in the *Bulletin*, which affords evidence of sound ophthalmological work.

A SANATORIUM PHYSICIAN ON THE STETHOSCOPE.

IN his report for 1929 Dr. J. Gravesen,[1] medical superintendent of Vejlefjord Sanatorium in Denmark —that institution in which so much pioneer work has been done since its foundation by Prof. Saugman 30 years ago—takes stock of the present state of the tuberculosis problem as far as the early diagnosis and most effective treatment of pulmonary tuberculosis are concerned. It really is amazing what a change has come over this scene during the last few years, and Dr. Rip-van-Winkle after sleeping for a decade or so would now wake up to quite a new world. It is not new only in that ephemeral world of treatment, in the durability of which none of us trusts, but also in the field of pathological anatomy in which some of us have been tempted to find truths and facts more lasting than brass. Only a decade or two ago the first deposits of tubercle in the lung were to be found in the apex, above the clavicle. Now they have shifted further down; and it is in the early infiltration demonstrable by the X rays, below the clavicle, that the radiologically-minded, radiographically-trained, pathological anatomist now seeks the beginning of things tuberculous in the lungs. The practitioner may ask: "What concern is it of mine, this new vogue?" The answer to this question by sanatorium specialists like Dr. Gravesen is more or less as follows: Thanks to the understanding and perfecting of serial skiagrams of the lungs, it is now possible, if a specialist in this field is employed, to detect the signs of incipient pulmonary tuberculosis much earlier than was the case only a few years ago. Phenomena which less than ten years ago were regarded as early signs of tuberculosis are now considered as late signs thereof. The first onset of the disease, the stage in which there is an early extension of the infection in a limited area of the lung (the early subclavicular infiltration) is often, probably in most cases, mistaken for a "cold," influenza, or the like. After invaluable time has been lost, and the early and most curable stage of the disease has been irrevocably passed, the patient is put on the waiting list of a sanatorium, whose medical superintendent ultimately examines him and finds advanced disease in a case "sent for diagnosis, query early tuberculosis." Dr. Gravesen writes:—

"In the face of this tragic situation, we may derive help from recent gains in our knowledge which emphasise unequivocally the fact that the earliest beginnings of pulmonary tuberculosis are associated with insignificant and often quite negative stethoscopic signs . . . the stethoscopic examination, even when it is carried out with all the finesse which, in the course of time has been devised for its rescue, is an exceedingly imperfect device which must of necessity be supplemented by serial skiagrams, supported by fluoroscopy, if it is to be a guide to the detailed diagnosis."

Be it noted that this is not the opinion of a specialist who has studied no other special branch of medicine than radiology, and who despises other means of diagnosis, such as auscultation and percussion, largely because he has not practised and mastered them. It is the opinion of a sanatorium physician who, though specialising in radiology, has perforce had to familiarise himself with every known test of tuberculosis. Dr. Gravesen does not hesitate to describe the outcome of recent advances in our knowledge of the genesis of pulmonary tuberculosis as "a new era," with preventive and therapeutic possibilities transcending anything hitherto achieved in this field. Though the stethoscope will assuredly be used as long as man survives as a more or less intelligent being on the earth, it would seem that the time is passing when, in the hands of a distinguished and emphatic specialist, it proves, in the span of ten minutes or so, to be the sole arbiter of our fate.

[1] Meddelelser fra Vejlefjord Sanatorium, 1930, pp. 28.

SENSATION OF HEAT AND COLD.

THE study of the skin as a sense-organ has attracted less attention than the study of the other organs of special sense, and physiologists are not yet agreed on the nature and exact situation of the end-organs responding to thermal stimulation. Heat-therapy in its various forms is so frequently employed as an adjunct to treatment that any advance in the knowledge of the anatomical and physiological basis on which it must ultimately rest is welcome. In the current number of the *Journal of Physiology* is a report by H. C. Bazett, B. McGlone, and R. J. Brocklehurst on an investigation, carried out in the department of physiology at the University of Pennsylvania, on the temperatures in the tissues which accompany temperature sensations. By inserting thermo-couples into the skin at various depths, in the neighbourhood of warm and cold spots, the temperature changes were indicated by galvanometer deflection and recorded simultaneously with signalled temperature sensations. Small metal applicators, heated or cooled by circulating water, were placed over the selected areas of skin. Surface measurements showed that the temperature of the applicator was never reached by the skin, but was only slowly approximated. The rate of penetration of the thermal change was found to be 0·5 to 1·0 mm. per second, and was slowed by vascular dilatation. Warmth was found to be conducted more rapidly than cold. The latency of sensation was measured and correlated with the rate of penetration, allowance being made for the time taken in nervous processes. The estimated depth of the organs concerned was found to be 0·6 to 0·2 mm. for the end-organ for

warmth, and 0·15 to 0·1 mm. for that for cold, in the skin of the forearm. If the very superficial position of these structures should be confirmed by other investigators, it is interesting to note that they are in a zone to which actinic rays can penetrate, a fact which may point to a possible explanation for the physiological interaction of heat and short-wave stimulation of the skin. The rapid falling-off of the temperature changes in the deeper tissues is demonstrated very conclusively by the photographic records of the actual temperatures at the various depths. The fact that paradoxical results, indicating temperature changes opposite in sign to those anticipated, were recorded in some instances is a further proof of the difficulties encountered when attempts are made to raise the temperature of deep-lying tissues by superficial applications to the skin. Recent research work in this country has shown that when the skin is heated by radiant heat the rise of subcutaneous temperature is dependent on the wave-length employed.[1] By focusing the light of a carbon-arc lamp on the skin with a glass lens it was found possible to raise the subcutaneous temperature several degrees higher than by employing a source of dark heat. The latter produced more scorching and was not tolerated so well. The coördination of recent work on the warming of the deeper tissues of the body is important, not only from the clinical point of view, but also because it must prove a very important consideration in our estimation of the value of any method of heating our houses and possibly of cooking our food. As far as clinical methods are concerned the most efficient way of raising the temperature of the deep tissues, of a whole limb or of an organ, and so far the only reliable and accurate method, is the passage through these tissues of the diathermy current. The temperature can then be raised at will to the optimum desired and by passing the current in the direction of the longitudinal axis of the limb the whole column of blood is warmed. But when the diathermy current is applied with a view of raising the temperature of the body as a whole, it is frustrated by the compensatory heat-regulating mechanism of the body and the normal body temperature is regained shortly after the onset of treatment.

STOCK VACCINE IN BRONCHO-PNEUMONIA.

THERE are well-known difficulties in estimating the value of any particular line of treatment in such a disease as pneumonia, but it might be thought that any really efficacious method would reveal itself in reducing the mortality of broncho-pneumonia in young children. There is, however, wide disagreement as to the value of vaccines in this disorder. An interesting study has recently appeared in a special number of the *Journal de Médecine de Lyon*[2] devoted to diseases of children where Dr. Ch. Gardère and Dr. J. Savoye deal with their experiences in 72 unquestioned cases of broncho-pneumonia in children between birth and two years of age. The cases were rigorously selected in the sense that only those patients with the classical symptoms and signs were admitted to the series, and every effort was made to exclude cases of bronchitis or other mild complaint, only too often included in statistics of broncho-pneumonia. Lobar pneumonia was eliminated as far as possible by radiological examination; tuberculous broncho-pneumonia was excluded by post-mortem findings or the presence of a positive tuberculin reaction; throat swabs were taken whenever the appearance of the fauces was suspicious; and finally all cases admitted in the last stages of the disease—i.e., dying within 24 hours—were omitted from the series, as were examples of terminal broncho-pneumonia in marasmic infants. Of the 72 cases that remained 34 were treated systematically with a stock vaccine in daily and increasing doses until the temperature came down to normal, while at the same time the classical measures for treating pneumonia were adopted. Among these the mortality was 58 per cent. The remaining 38 cases were treated with various other remedies such as anti-pneumococcal serum, protein shock (injections of milk), and autogenous vaccines. Among these the mortality was 75 per cent., showing a difference of 17 per cent. in favour of stock vaccine. The authors, however, are careful to point out that three or four deaths more or less in either of the groups would have completely altered the final result. But while the value of their vaccines remain uncertain there are several points of interest in their analysis of the results. For example, the greatest apparent benefit from the vaccine was found in the age-group 6–12 months, while it failed completely, as indeed did any form of treatment, to help the secondary forms of broncho-pneumonia following whooping-cough, measles, and chicken-pox. Autogenous vaccines prepared from organisms present in the nasopharynx during an attack proved less efficacious than stock vaccine containing the organisms habitually met with in broncho-pneumonic lesions. Antipneumococcal serum was not only disappointing but actually harmful. The care paid by Dr. Gardère and Dr. Savoye to the accuracy of their diagnosis and their appreciation of the difficulties of assessing the results are to be set against the smallness of the series. The evidence they adduce in favour of stock vaccine justifies a more extended trial under similar rigorous conditions.

[1] Hill, L.: Journal of Actinotherapy, March, 1929.
[2] Feb. 20th, p. 125.

NOISE IN HOSPITALS.

HOSPITAL patients often have to put up with a perpetual disturbance by small noises, and Dr. Harvey Agnew[1] points out that this nuisance is largely due to the echo and amplification of sounds right through the building. This is, he says, partly a result of modern fireproof construction with tile or concrete on a rigid framework of steel. In residential houses the reverberation which characterises an empty room or building is overcome by furnishing and by various surfacing materials which absorb the sound and so prevent it from being thrown from wall to wall. The coefficient of absorption of various substances has been established on the basis of comparison with an open window, the absorptive value of which is taken as one. Carpets have a coefficient effect of 0·15 to 0·3, and heavy rugs from 0·3 upwards. Tiles made of fibre, felt, or mineral products may have a coefficient of 0·45 to 0·74, but linoleum or varnished wood only of 0·03, concrete of 0·015, and terrazzo or marble 0·01. Ordinary smooth plaster ceilings are said to reflect a higher percentage of sound waves than a mirror does of light waves. The long, open tunnel corridor and lift shaft transmit sounds from end to end of the hospital. Much noise can be eliminated by breaking the corridor at frequent intervals with self-closing doors and enclosing the lift shaft and stair wells. Cross-beams across a corridor ceiling help to break sound waves, and ward doors set back from the corridor line stop conduction along the walls. Although terrazzo is a clean and durable flooring it is noisier than linoleum or rubber, and amplifies the sound of footsteps while linoleum deadens them. Better than ordinary concrete are cinder concrete or "aerocrete;" the latter is made with a specially prepared cement which breaks up the admixed water into gases and makes the concrete spongy and light. Few modern buildings show any serious attempt to make the walls sound-proof. A good filler for this purpose is powdered gypsum, which is also strongly fire-resisting. Dr. Agnew quotes Prof. Sabine as saying that a 2-inch air space has as much insulating power as a 6¾-inch solid brick wall, provided the space is not bridged by anything rigid; but even a single nail driven right through will cause vibration on the inner surface.

[1] Canadian Med. Assoc. Jour., March, 1930, p. 414.

In a new building sound transmission along the ceiling can be reduced by suspending the ceiling from special hangers broken by felt pads. Old ceilings can be coated with a sound-absorbing material, such as an acoustical plaster made of pumice particles bound with cement or gypsum. The entry of street noises into wards can be reduced by reflectors outside the windows and baffle boards faced with sound-absorbing material fastened vertically 4 inches inside the window. Much annoyance may be caused to patients by loud buzzers or bells on the telephone system, the clicking of noisy locks, and the noises of plumbing. Knobs and clicking latches can be replaced by hooks, and doors can be provided with checks and springs. A new plumbing silencer has recently been perfected.

That elaborate precautions for the supression of noise are no unnecessary fad has been shown, it is stated, by Laird's experiments at the Colgate Psychological Laboratory. He found that a passing truck, without wakening a sleeper, may so disturb him that his systolic blood pressure rises 20 mm., while increased muscular tension is recorded by a galvanometer. Obviously this response must have an exhausting effect upon the nervous system, and in a patient who is seriously ill may make possibly a difference between recovery and collapse.

THE SPREAD OF PUERPERAL SEPSIS.

THE earlier part of Dr. Macgregor's report[1] on puerperal infection in maternity hospitals describes a series of outbreaks which were all severe, rapid in spread, and extensive in incidence, considering the number of patients exposed to risk. In one group infection was introduced by the admission of a case of septic abortion; in a second group the origin of infection was uncertain, but cases recurred after the wards had been closed for some days and reopened with a new nursing staff; while in a third group the infection possibly came from a woman with persistent pyrexia ascribed to bronchitis; or, later, from a midwife with a septic finger. The report makes it clear at least that puerperal infection can spread readily under the average conditions obtaining in a nursing home, and that it tends to be persistent. On the other hand, cases of septic infection often occur in hospitals without giving rise to other cases, and this is no doubt because they are recognised early and strictly isolated before removal. No relationship was found between the presence of hæmolytic streptococci in the throats of the staff and the incidence of infections. Preventive measures, Dr. Macgregor points out, include the exclusion of parturient women who are infected, or presumably infected, from hospital wards. He quotes Dr. James Young's suggestion that cases untouched before admission should have their own institution, and that cases which have been subjected to certain kinds of interference before admission should be accommodated elsewhere. But cases where there has been manipulative interference do not necessarily become septic, and infection may occur after a single vaginal examination or after no interference at all. "It is doubtful," says Dr. Macgregor, "whether a water-tight administration based on segregation of patients in different institutions in accordance with the degree of interference before admission would be practicable or even a satisfactory method of meeting the difficulty." In the groups of cases investigated the infection appears to have spread with ease among patients whose confinements were otherwise normal, in spite of precautions and great alertness on the part of the staff. The transmission could therefore scarcely have been due to a temporary or accidental defect of technique. It is more likely, he thinks, that infection was propagated by hands, instruments, or dressings, than by infection of the staff and their conversion into carriers of the organism. But it is reasonable to assume that infection may occur from a lesion on a nurse's finger or an organism carried in her throat. Apparently the passage of infection among parturient women is insufficiently hindered by the technique in vogue, and it must be decided whether the conduct of labour in institutions is susceptible of improvement to a point at which the danger is, at any rate, reduced to a minimum. The report suggests that the evolution of a "faultless technique" demands further attention.

[1] Puerperal Infection in Maternity Hospitals: A Report to the Department of Health for Scotland. By A. S. M. Macgregor, M.D., Medical Officer of Health for Glasgow. H.M. Stationery Office. 1930. Pp. 20. 9*d*.

LIMITATION OF NARCOTIC DRUGS.

THE report which the Advisory Committee on Traffic in Opium and Other Dangerous Drugs has recently submitted to the Council of the League of Nations shows that an important stage has been reached in its deliberations. The Committee has devised a plan for estimating the world's legitimate requirements of narcotic drugs, and a workmanlike scheme for approximating world production to these requirements and apportioning the amounts to be manufactured and supplied by the various producing countries. It is proposed that each country should furnish annually to a central authority an estimate of its requirements for medical and scientific purposes of the drugs in question, production to be limited to the total amount of these estimates. The calculations would be based on the actual legitimate consumption at the present time, but each country is to be allowed to budget for a margin of supplies to cover possible fluctuations, provided that the amount is stated separately. In addition, facilities are to be given for establishing reserve stocks, but it is proposed to endow the central authority with power to intervene in the event of estimates appearing to be excessive. A pooling arrangement is to be made by manufacturing countries to each of which will be apportioned the amount it will be eligible to contribute to the pool. If the scheme can be put into operation and worked successfully, the problem of controlling the narcotic drug traffic will be solved at its very source, and the domestic supervision of the traffic by each nationality will be greatly facilitated.

INCIDENCE OF TUBERCULOSIS AMONGST HOSPITAL NURSES.

IN the March number of the *Canadian Medical Association Journal* Dr. E. L. Ross gives an account of 60 nurses who were admitted to the Manitoba Sanatorium suffering from tuberculosis. These nurses were in course of training or had finished their course at 20 different hospitals, but 54 of them came from institutions in Manitoba, so that the investigation applies almost entirely to this province. Of the 60 nurses who developed clinical tuberculosis, 50 of them broke down during their period of three years training or within one year of finishing it. Fifteen of them were below the age of 20 when this happened and 34 not yet 22. In a previous series of 69 breakdowns it was found that 81 per cent. of the nurses had begun their training before or at the age of 22. The figures suggest that the younger nurses are more likely to break down and that infection is apt to occur during or shortly after training in hospital. The incidence of tuberculosis amongst these nurses was about 6 per cent., a figure far above that for other women of their age-group; this agrees with the observations[1] made by Dr. J. Heimbeck in Oslo, where tuberculosis was much more rife amongst nurses than the general population. He found that it developed far more commonly in nurses who had a negative than in those who had a positive Pirquet reaction at the outset of their training. Of Dr. Ross's 60 cases, 34 had an acute onset which suggests a recent infection; in 19 of them the lesions were hilar or basal, and most of them did well with pneumothorax treatment. In this country, also,

[1] Arch. Int. Med., 1928, xli., 336.

it is familiar experience that acute tuberculosis developing in a young adult frequently affects the middle and lower portion of the lungs and, though apt to spread rapidly and end fatally, is none the less amenable to rest, and especially to pneumothorax treatment, in the early stages. The type and course of the disease do not seem to differ from that which occurs in other women of that age-period, but it seems unquestionable that nurses are especially liable to contract tuberculosis. We should be glad to know whether Dr. Heimbeck's observation that the tuberculin test is so frequently negative in those subsequently affected is true for other communities.

THE ŒSTRUS-PRODUCING HORMONE.

A GREAT deal of work on the ovarian hormones is being done both here and abroad, and in some ways their nature and significance has lately become much clearer. The problem is difficult because their recognition in fluids and organs depends on biological tests, which makes it impossible to be sure that all the œstrus-producing extracts prepared from many tissues, including those of the male, are identical in constitution. In such circumstances the isolation of the active substance in a pure form, especially when crystalline, is of considerable importance. Even so, the elucidation of its chemical constitution may be difficult, and its artificial preparation still more difficult. The first report of the preparation of the hormone in crystalline form was made by E. A. Doisy at the Thirteenth International Physiological Congress in August of last year. This author has not yet published his full results, but in the preliminary statement then issued he said that the amount required to restore the sexual cycle in castrated female rats was one eight-millionth of a gramme of the crystalline material. Since this announcement several other workers have obtained crystalline products of similar activity. Last December A. Butenandt, using a preparation from the urine of pregnant women, succeeded in obtaining a sufficient amount of the crystalline material, to which he gave the name "progynon," to study its chemical properties in some detail. This work has already been reviewed in these columns.[1] Details of the method of testing used have recently been published,[2] and the animal tests are described in full. Complete details of preparation have not yet appeared. The name suggested by Butenandt is open to objection, inasmuch as it was in use previously, and refers to a commercial (non-crystalline) product which was, in fact, the material furnishing the starting-point of Butenandt's research, and not its final result. Crystalline preparations have also been briefly described by Laqueur, Dingemanse, and Kober,[3] and more fully by H. Wieland, W. Straub, and Dorfmüller,[4] and by Marrian.[5] Butenandt considers that, on the basis of the animal standardisations, the products of the two former groups of workers are much cruder than his own preparation. It is well known that varying results are obtained according to the exact method used in carrying out the animal test, so that such criteria of purity need careful investigation and comparison before they can be accepted as conclusive. Butenandt, in his most recent publication mentioned above, now states that by giving a divided dose of his crystalline product spread over a period of 48 hours the activity is increased to the astonishing figure of 35 to 40 million mouse units per gramme of material.

A considerable contribution to this interesting subject is now made by Frattini and Maino in a paper on the preparation of the follicular hormone in a crystalline water-soluble form.[6] The term "follicular hormone" is used to indicate the supposed source of the hormone in the liquor folliculi of the Graafian follicles. Since this point is disputed, it seems better to use some other description, of which the terms "œstrus-producing hormone" or, as A. S. Parkes has suggested, "œstrin" appear to be the least confusing and clearly refer to the most marked action of these preparations—namely, the restoration of the œstral cycle in the ovariectomised female animal. These workers have found it possible to obtain, and in a crystalline form, an œstrus-producing hormone from the ovary and urine of pregnant women by a method for the extraction of this substance different from those employed by other workers. Further, they have been unable to obtain this crystalline body from the urine of non-pregnant women at any period of the menstrual cycle, or from the urine of males. The main features of their method are as follows:—Preliminary purification is obtained by treating concentrated urine or the filtrate obtained from macerated ovaries with neutral salts. From the precipitate the active hormone is extracted with alcohol. The impurities are removed by acids and alkalis, and by successive precipitation with salts of the heavy metals which are subsequently eliminated by sulphuration and extraction with ether. The crystals obtained after evaporation of the ether are needle-like in character, as illustrated in photomicrographs. They differ a little in size according to the source of origin. The physical and chemical properties are provisionally mentioned, but are to be described more fully in a subsequent paper. Sterols are suggested as a possible chemical constitution of the substance. Physiologically it appears to be somewhat less active than the preparations described above, the mouse unit by the divided dose method being given as one-millionth of a gramme. Whether these various crystalline substances are the same substances or whether they still consist, even after such exhaustive purification, of mixtures of the active substance with some crystalline "impurity" remains for the future to decide. At present full reports are lacking in most of the cases mentioned above, and it would be premature to compare these results until full details are available. The degree of purity already reached is such as to tax the most sensitive methods of chemical analysis and research, and this, combined with the exorbitant amount of material required as the starting-point, exerts a restraining influence on extensive chemical work on this substance. These difficulties are evidently being at present rapidly overcome, and the importance of this extremely potent preparation justifies the expenditure of so much energy and skill on the elucidation of the problem.

[1] THE LANCET, Jan. 4th, p. 42; Jan. 11th, p. 94.
[2] Butenandt, A., and Zeigner, E. von: Hoppe-Seyler's Zeit. für physiol. Chem., 1930, clxxxviii., 1.
[3] Nature, Jan. 18th.
[4] Zeit. für physiol. Chem., 1929, clxxxvi., 97.
[5] Jour. Soc. Chem. Ind., March 21st, p. 237.
[6] Frattini, B., and Maino, M. A.: Archiv. Istit. Biochim. Ital., 1930, ii., 3.

IMMUNISED SERUM IN POLIOMYELITIS.

ON various occasions we have referred to the treatment of poliomyelitis with serum administered at an early stage. The greatest difficulty in this mode of treatment is to recognise the disease early enough, but there is also another difficulty—namely, that the only efficacious serum available has been that of human beings who have suffered from poliomyelitis. Attempts to produce artificially a serum with antiviral properties have hitherto been unsuccessful, and the only animals whose blood has been shown to contain specific antibodies are monkeys which have actually had the infection. In a recent paper,[1] however, Dr. R. W. Fairbrother, who is working at the Lister Institute in London, describes the production and the testing of a serum with anti-poliomyelitic properties which has been obtained from the horse. The animal received, over a period of some two months, 15 graded injections of an emulsion prepared from the spinal cord of monkeys which had died of poliomyelitis. The strain of virus with which these monkeys had been infected was an especially powerful one, and it had been found

[1] Jour. Exper. Path., February, 1920, p. 43.

to give very consistent results. The disease which it produced had an incubation period of about five days, and death always followed three or four days after the onset of symptoms. The minimal infecting dose was found to be between 0·0005 and 0·003 c.cm. of emulsion. The injection of emulsified spinal cord material from these monkeys produced in the horse no definite sign of reaction as determined by pulse and temperature. Blood was withdrawn before beginning the inoculation and at intervals during the latter part of the series, and the serum was submitted to severe tests to determine its protective properties. The method of testing consisted in mixing small portions of serum with an amount of infective emulsion equivalent to at least 100 times the minimal infective dose, and injecting the mixture intracerebrally into monkeys. Control animals received similar injections of virus emulsion mixed with saline. It was found that the normal serum of the horse taken before inoculation had no effect on the virus, the incubation period in the monkey subsequently infected being within the usual limits. The serum taken from the horse towards the end of the course of inoculations showed definite antiviral properties and, provided the amount of serum was equal in quantity to the amount of infective emulsion employed, no poliomyelitis resulted in the monkeys from injection of the mixture. The power of the horse's serum to neutralise the virus was found to increase pari passu with the strength of the inoculation which the horse had received, the serum of the third bleeding having a distinctly stronger action than that obtained at the first bleeding. After a resting phase of two months, more blood was taken from the horse and was tested in a similar way. The results of this test were deprived of their full significance by an intestinal infection in some of the monkeys, but it appeared that during the resting phase the antibodies in the serum had decreased. An attempt was later made to assess the curative action of this serum by injecting it into monkeys at various intervals after they had been infected with the powerful strain of poliomyelitic virus which was being used. Unfortunately, however, these experiments were vitiated by the occurrence of another infection in the experimental animals. Some comparative tests have also been made with human convalescent serum, and from the results obtained it appears that the antiviral content of the serum obtained from the horse at the end of the course of inoculations was at least as great as that of the human convalescent serum. Since the diagnosis of poliomyelitis in the earliest stages is as yet impossible, the production of serum from animals may not have an immediate practical application, but if serotherapy is to be useful during epidemics it is apparent that the serum must be available in large quantities in order that it may be given even to doubtful cases and possibly to certain contacts. For this reason Dr. Fairbrother's work may well prove of great practical importance.

At its session on March 28th Dr. Arnold Netter [2] told the Société Médicale des Hôpitaux de Paris about a case which he described as "rapid cure, following injections of immunised monkey serum, of poliomyelitis in the preparalytic stage." The patient, a child of five, received, in the course of four days, 40 c.cm. of serum from an immunised hamadryad monkey and also 50 c.cm. of antipoliomyelitic horse serum. Recovery was complete.

THE ENGLISH CONJOINT QUALIFICATION: ADMISSION OF FOREIGN GRADUATES.

THE new edition of the regulations for the diplomas of L.R.C.P. and M.R.C.S. contains important alterations which will take effect after July.

Candidates for the licence are required to complete five years of professional study. Before beginning this they must pass a recognised examination in general education and also an examination in chemistry and physics equivalent to Part I. of the "pre-medical examination" in chemistry, physics, and biology. The professional examinations are two in number, and each has two sections, as follows :—

First Professional Examination.—Sect. I. Anatomy and Physiology. Sect. II. Pharmacology and Materia Medica.

Final Professional Examination.—Sect. I. Pathology. Sect. II. Medicine, Surgery, and Midwifery.

The most important alteration is in the conditions under which students and graduates from abroad are admitted to the Final Examination. The new regulations may be summarised as follows :—

1. A candidate holding a licence in *India*, whether he has completed four or five years' curriculum—is required : (*a*) to pass a recognised Preliminary Examination in General Education, in accordance with the Regulations of the Examining Board in England ; (*b*) to pass the First Examination in Anatomy, Physiology, Pharmacology, and Materia Medica ; (*c*) to complete two years' (24 months) Medical and Surgical Hospital Practice in a recognised Medical School and Hospital in this country after passing Sect. I. of the First Professional Examination. Admission to one subject of the Final Examination is allowed after 18 months of such Hospital Practice.

2. A candidate who has qualified in India after a full curriculum of not less than five years at certain recognised Medical Colleges is exempted from Sect. II. of the First Examination and requires only one year's Hospital Practice before admission to the Final Examination.

3. Candidates who have not obtained a licence or other qualification in India, are required to pass the Preliminary Examination and the Pre-Medical Examination, to complete the full curriculum and to pass the First and Final Examinations.

4. Candidates who have completed part of the curriculum at a recognised Medical College, but have not qualified in India, are required to pass a recognised Preliminary Examination in General Education, but are exempted from the Pre-Medical Examination, and are allowed to count such part of the curriculum thus completed in India. They must pass the First Examination and complete the full curriculum before admission to the Final Examination.

5. Candidates holding the Diploma of the National Board of Medical Examiners of the *United States of America* are admissible to the Examinations for the L.R.C.P., M.R.C.S., under the same conditions as Members of recognised Universities in the British Possessions.

6. Members of recognised *Universities outside the British Possessions* are admissible to the Examinations under the following conditions : (*a*) Graduates in Medicine and Surgery are required to pass the First Examination, and subsequently to complete 12 months' Hospital Practice at a recognised Medical School and Hospital in this country, before admission to any part of the Final Examinat on ; (*b*) Undergraduates are required to complete the full curriculum of 33 months for the Final Examination at a recognised Medical School and Hospital in this country, after passing the First Examination. Hitherto it has been possible for foreign graduates to proceed at once to the Final Examination.

Prof. J. J. R. Macleod, F.R.S., will deliver the Oliver Sharpey Lectures at the Royal College of Physicians of London on Tuesday, April 29th, and Thursday, May 1st, at 5 P.M. His subject will be Diabetes as a Physiological Problem.

ROYAL INSTITUTE OF PUBLIC HEALTH.—The preliminary programme of the next annual congress of this institute, which will be held at Portsmouth from June 4th to 9th, has been issued. Among the discussions which will take place in the various sections is one on National Health and the Local Government Act of 1929, and one on Radium and Cancer Clinics (Section of State Medicine and Municipal Hygiene). Papers read to the Naval, Military, and Air Section will include those on Post-Encephalic Parkinsonism and Military Pensions and on the Control of Malaria at H.M. Naval Base, Singapore. The Section of Industrial Hygiene will discuss Health in Seafaring Occupations, the Health of Women and Girls in Industry, and the Health of Dockyard Workers among other subjects. The Prevention of Sickness and Death in Motherhood is the main subject for debate at the Section of Women and Children and the Public Health, while papers will be read on the cognate subjects of Post-Puerperal Disabilities in Women and the Hygiene of the Domiciliary Labour Room. In the Section of Tuberculosis the Present Position of Surgical Treatment of Pulmonary Tuberculosis will be discussed.

[2] Bull. et Mém. de la Soc. Méd. des Hôp. de Paris, April 7th, p. 537.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LXVIII.

SIGNIFICANCE OF PROTOZOA, SPIROCHÆTES, AND HELMINTHS IN THE BLOOD.

PART I.*

IN no other branch of medicine does laboratory diagnosis assume more vital importance than in the diseases of tropical origin; so that in order to estimate the import of a positive blood examination, and so as not to *underestimate* the significance of a negative finding, it is essential that the practitioner should be familiar with the life story of organisms found in the blood in tropical disease. In other words, in almost all blood infections the investigator is playing a game of hide-and-seek with minute parasites which are influenced by a number of incompletely understood circumstances. Therefore, one negative result, or even a series of negative results, need not necessarily invalidate a diagnosis which is rendered probable on clinical grounds.

The Malarial Parasite.

In tropical practice malaria assumes the chief place, and at the outset it is necessary to bear in mind that this term embraces not one disease, but a group of fevers due to three distinct parasites. The life cycle of the *benign tertian* and the *quartan* in the blood stream differs very considerably from the *malignant* or *subtertian*. In the two former the process of schizogony takes place in the red blood corpuscles circulating in the peripheral blood, while in the latter the greater part of this process is evolved within the capillaries of the internal organs. It is necessary to recapitulate a few well-ascertained facts concerning these parasites and their associated diseases.

The *benign tertian* is the most widely spread form of malarial infection. The parasite is apparently common in the true tropics, subtropics, and even in temperate countries such as Russia and Holland, but appears to be absent or extremely rare in tropical and West Africa. It is the form which is most abundant in the blood stream during the febrile paroxysms and, unless it persists unchecked and the bodily resistance is low, no grave anæmia may ensue, though it may be difficult definitely to diagnose this form of malaria in the quiescent or afebrile periods. Relapses of benign tertian malaria may ensue at long intervals after the initial attack. It is comparatively common for the first relapse to take place one year after the first paroxysm; and in the interval the patient may show no outward evidence of infection at all. The parasite appears to have a life span of considerable length in the human body and to be viable (or liable to recur in appreciable and easily recognisable numbers) for three years from the initial infection. It is improbable that it can persist for a longer period, a fact which is not adequately recognised—too often this non-appreciation is the cause of errors in diagnosing (on clinical grounds) recurrent malaria in an individual who has left a malarious district for ten years or even longer. During the actual rigor the parasites can be found in the greatest numbers in the ring stage, at a later period as more mature schizonts. It is a common error to suppose that it is fruitless to examine the blood during the apyretic periods, or immediately after the defervescence of the fever. I regard it as essential that a prolonged blood examination should be done by an experienced microscopist in every case of suspected malaria, for often, in the absence of any other suggestive circumstance (such as anæmia and splenomegaly) scanty parasites in the gametocyte stage may be found, and the definite recognition of one such organism will definitely clinch the diagnosis. The benign tertian parasite is readily affected by quinine in so far as the number of circulating parasites rapidly become distorted and disappear, but the gametocyte stage is the least susceptible and often persists after quinine therapy has been instituted for some considerable time. In contradistinction to the other two forms, periodic relapses with large numbers of parasites in the blood are liable to recur in spite of prolonged and full therapeutic dosage with quinine. It can be taken as proven that in every benign tertian paroxysm parasites can be demonstrated in the blood with ease—but some weeks afterwards diagnosis by this means may be impossible, so that finer changes in the red blood cells, basophilic stippling, polychromasia, and the proportional increase of the large mononuclear cells (mononucleosis), have to be relied upon to suggest a probable diagnosis.

Quartan malaria has by no means such a wide distribution as has benign tertian. Wherever it occurs in the tropics it has a patchy local distribution and it is found sparingly in more temperate climates, such as Macedonia, Bulgaria, and Italy. It most commonly occurs in children in whom it may cause singularly little disturbance, and it may not produce any obvious outward form of disease. Apparently, this parasite is most easily tolerated by man, and, as a rule, produces less dramatic attacks of fever than does the benign tertian. The parasite may be easily recognised in its more advanced stages by its peculiar morphology. It persists in appreciable numbers in the blood during the apyrexial period and may sometimes be found when the patient is apparently in good health. Its other characteristics are its longevity in the blood stream—as far as is known this greatly exceeds the other two species—so that a single infection may persist and produce relapses for as long a period as seven years. For these reasons quartan infection in the blood can be more easily detected than in benign tertian. Its parasites are less easily destroyed by quinine than are those of the other two species, so it comes about that unaltered forms may be demonstrated in the blood stream for ten days or more, subsequent to its adminstration.

In the *malignant* or *subtertian* infection a much more complicated problem presents itself. As has been already stated, the parasite reproduces itself by sporulation in the capillaries of the internal organs, such as the spleen, liver, pancreas, heart, and brain. The blood-supply of these vital parts may be seriously interfered with or even temporarily blocked. A proper understanding of these facts will assist the practitioner in recognising the protean clinical manifestations of subtertian infections and at the same time will enable him to appreciate some of the difficulties in microscopic diagnosis. Examination of the peripheral blood in subtertian malaria is often negative. This may happen when in fact large numbers of parasites are proliferating in the internal organs of the body. The intermediary stages of schizogony do not normally occur in the peripheral blood, so that the youngest or ring form, and the fully developed crescent or gametocyte stage, are the only ones which are normally to be found circulating in the blood in subtertian infections. I am convinced that in early cases of subtertian malaria the parasite in the ring stage may be found in the blood stream without being associated with any external signs of illness. The onset of what may eventually prove to be a very serious or sometimes fatal illness is so insidious that as a matter of routine I find it advisable to examine the blood of every one returning from the West Coast of Africa, whether or no they present a history of previous febrile attacks. On the other hand, during an acute attack,

* Part II. will appear next week.

such as the well-known bilious remittent form, the parasites may exist in enormous numbers and multiple infections of red blood corpuscles may be found. The gametocyte, or crescent stage, is rarely seen in fresh infections in Europeans in the tropics. It appears usually in longstanding cases where anæmia and cachexia are very evident, or in patients who have returned to temperate climates after suffering severely from subtertian fever. In fact, the circumstances underlying the appearance of this parasite in the peripheral blood are so variable that it is difficult to describe them concisely. Subtertian malaria may provoke the most serious or even fatal symptoms, and yet the parasite may not be demonstrable in the peripheral blood. This is often true in cerebral malaria with coma, in what is known as the pre-blackwater fever state, and even in an average severe case of subtertian fever. I have seen cases with multiple rigors, bilious vomiting, and splenomegaly in whom repeated and prolonged search of the blood has failed to reveal a single parasite. In order to facilitate microscopic diagnosis in this important fever, the thick drop method is frequently employed, though with the possible exception of crescents, which may be more easily demonstrated, its utility to the clinician is questionable. There are other distinctive characters of subtertian malaria. It has the shortest life-span in the human body, and a patient leaving the endemic area need not fear relapses after a residence of nine months to a year in a temperate climate. During the whole of this period, however, the liability to the development of pernicious symptoms and to blackwater fever may persist when he is exposed to overfatigue or to cold. Subtertian infections are susceptible to the action of quinine, and the less mature stages, such as the rings, rapidly disappear from the blood stream under its influence. The crescent, or gametocyte, is least affected by therapeutic doses, but appears to be more readily destroyed by plasmoquine. When the anæmia is advanced—and it may approach the pernicious type in malaria cachexia—I have found that the ring forms and the crescents are particularly difficult to demonstrate, and it is these cases which should be regarded as most serious from the point of view of prognosis and liability to the development of blackwater fever. From the foregoing it will be understood that a diagnosis of subtertian malaria has sometimes to be made in the absence of a positive laboratory finding. Subtertian infections are more usually associated with definite splenomegaly, secondary blood changes, and a leucopenia than are the other two forms.

Double or Multiple Infections.—Malaria may complicate any other form of disease, especially enteric and dysentery infections, and it may even complicate itself. In the tropics it is comparatively common to find double infections of *benign tertian* and *subtertian* and such an occurrence necessarily influences treatment and prognosis. Serious or alarming symptoms arising in a case of supposedly simple benign tertian fever can very often be ascribed to a coexisting infection with the latter parasite, and this is usually the case in which blackwater fever supervenes consequent upon a paroxysm of benign tertian. Very rarely all three species of parasites are found in the same individual.

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HOSPITAL COSTS.—Last year each of the 1164 in-patients at Leeds Hospital for Women stayed an average of 13·6 days, and cost £6 17*s.* 5¾*d.*; out-patients cost about 2*s.* each. At York County Hospital (2505 in-patients), the cost was £8 9*s.* 7*d.*, a reduction of 14*s.* 10*d.*, and the average stay 24 days, a reduction of one day. On the other hand, at the Feilding Palmer Cottage Hospital, Lutterworth, (89 in-patients in 16 days), the expenditure per head, at £9 15*s.* 8*d.*, was an increase of £1 7*s.* 6*d.* on the preceding year. At Rugeley District Hospital, 185 in-patients (17·7 days' stay) cost £2 6*s.* 5*d.* per head per week.

Special Articles.

THE EFFECT OF ULTRA-VIOLET LIGHT TREATMENT ON YOUNG CHILDREN.

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RECENT observations on the therapeutic use of ultra-violet light have made the doubters more doubtful, but have failed to lessen the enthusiasm of the advocates. What chiefly emerges is the insufficiency of objective data. Those actually using the ultra-violet lamps and watching the effects on their patients are almost always convinced that rapid beneficial results are obtained, but these impressions are of little value except as personal convictions. The difficulties of obtaining objective data were evident in the investigation which we are about to describe, but certain definite facts undoubtedly emerge.

We have been closely concerned in the supervision of the Birmingham Child Welfare Light Clinics, of which there are now nine in the city. These clinics treat children under five years of age, mainly for rickets and debility, and during 1928 no fewer than 1375 children attended the clinics, making 16,481 attendances. This seemed to offer a large field for investigation, but careful inspection of the records showed that only 346 were sufficiently complete for detailed study. In a large number attendance at the clinics had been interrupted by illness in the house; in others the final medical examination had been omitted because the mother failed to attend with the child. It will be understood that prolonged regular attendance is often difficult to obtain.

The procedure for admission to the light clinics is as follows. Children are recommended by the doctors at the child welfare centres and by family practitioners. They are then called to the medical examination clinic, where they receive a complete physical examination and, if considered suitable, light treatment is prescribed. In some cases other suggestions are made and no light treatment is ordered. The dose normally given is a fourth of the erythema dose (calculated on an average adult), and this is checked by giving an erythema test to each child, any undue sensitiveness indicating a reduction of the dose. Treatment is given twice weekly, and the dose is not progressively increased, since the mercury-vapour lamp is used, and there is no pigmentation. The lamps are all of the Kelvin Bottomley and Baird pattern, either 220 or 440 volts. The child attends for six, eight, or twelve treatments, and is then seen again by the medical officer.

The 346 records were selected for the following reasons:—

(*a*) Regular attendance at the clinic.
(*b*) A weight record at the beginning and end of treatment.
(*c*) No intercurrent event which made the evaluation of the result difficult—e.g., intercurrent illness, hospital treatment, country holiday.

The conditions from which the children were suffering can be classified broadly in the groups shown in Table I., and defined as given below.

1. *General Debility.*—This group comprises children of poor physique, unusually underweight and not gaining, frequently flabby and anæmic, and of subnormal vitality. The condition frequently follows an acute illness or infection. It does not include children suffering from any definite catarrhal condition; these are all included in the next group

2. *Catarrhal Cases.*—This group includes those children suffering from or excessively liable to catarrhal infections, such as rhinitis, tonsillitis, bronchitis, and otorrhœa. The majority suffer also from general debility.

3. *Rickets.*—Only those cases are included in this group where rickets is shown by X ray of the wrist bones.

4. *Malnutrition.*—This group includes those cases not suffering either from catarrhs or general debility but who, from one cause or other—e.g., inadequate diet, insufficient rest—are considerably below the normal weight and are failing to gain. Often no definite cause for the condition was assignable.

5. *Debility Due to Mismanagement.*—This group includes those children who may be summed up as "the spoilt child," and whose physical health has suffered.

6. *Amyotonia.*—This group includes children who have nothing much wrong with them but who are lethargic and flabby. Frequently they are overweight.

7. *Nervous Excitability.*—This group includes nervous children who are over active and excitable, thin, not gaining weight, and frequently suffering from sleeplessness, night terrors, and anorexia.

TABLE I.—*Classification.*

Conditions.	Age-groups.				
	(1) 12 wk. to 1 yr.	(2) 1–2 yr.	(3) 2–3 yr.	(4) 3–4 yr.	(5) 4–5 yr.
General debility ..	31	67	14	6	12
Catarrhal cases ..	22	34	19	10	8
Malnutrition ..	9	7	2	3	—
Rickets	4	20	6	1	—
Debility due to mismanagement ..	2	12	6	3	—
Amyotonia	2	10	2	—	1
Nervous excitability	3	6	3	1	1
Other conditions* ..	5	4	3	3	4
Total ..	78	160	55	27	26

Total = 346.

* Other conditions include bronchitis, asthma, and skin conditions.

It will be seen that the conditions treated were various, but the composite picture is that of a child failing to gain in weight, and a cause of anxiety to the parents from the obvious evidence of failure in normal health. These children had almost all attended child welfare centres and the usual advice about diet and hygiene had been given.

Weight.

The simplest objective data of progress lay in the observation of the weight record of the child during treatment. The cases were placed in age-groups, and the average gain in weight ascertained as compared with the average for the normal child. The result is recorded in Table II.

TABLE II.—*Effect on Weight.*

Age-group.	No.	Average period of treatment in weeks.	Average gain in weight per week in ounces.	Percentage gain as compared with normal child.	Average gain in weight of normal child per week in ounces.
(under 1 yr.)	78	11	4·1	113·8	3·6
(1–2 yrs.)	160	12	2·1	123·5	1·7
(2–3 ,,)	55	11	1·9	125·7	1·4
(3–4 ,,)	27	12½	2·2	157·1	1·4

This shows a higher average gain in each age-group than is made by the normal child, and this in a group of children who were all more or less unhealthy and had failed to gain weight for some time. Further analysis was obviously required, however, and Table III. was prepared, showing the actual numbers gaining above, below, and at the average rate in each age-group, and also showing the type of home from which the children came, in case this factor should influence the result. It will be noted that the larger proportion came from good homes. This is due to the selection of those cases making a regular attendance. The Table shows clearly that the type of home did not affect the result in any definite way. In passing, it should be noted that no free food or cod-liver oil is allowed in any of these cases by the clinics.

Table III. shows a more marked effect from light treatment on the weight of children between one and four years of age. This is possibly associated with the fact that the city child is out-of-doors less at this period than before or after—i.e., the period following the perambulator stage and preceding the independent stage. Taking all the groups, 54 per cent. of the children gained above the average, 24 per cent. below the average, and 21 per cent. at the average. None lost weight, and this the authors believe should be attributed to the cautious dosage used. Any excess of ultra-violet light appears invariably to cause a loss of weight.

TABLE III.

Age-group.	Type of home.	Gain above average.	Gain below average.	Gain at average.	Total.
I.	Good.	17	17	—	34
	Fair.	8	8	2	18
	Poor.	8	7	—	15
	V. poor.	5	6	—	11
	Total ..	38 (48%)	38 (48%)	2 (3%)	—
II.	Good.	38	6	18	62
	Fair.	13	4	16	33
	Poor.	16	4	6	26
	V. poor.	21	2	16	39
	Total ..	88 (55%)	16 (10%)	56 (35%)	—
III.	Good.	15	3	8	26
	Fair.	4	2	3	9
	Poor.	5	0	2	7
	V. poor.	8	2	3	13
	Total ..	32 (58%)	7 (13%)	16 (29%)	—
IV.	Good.	10	5	—	15
	Fair.	4	1	—	5
	Poor.	2	—	—	2
	V. poor.	4	1	—	5
	Total ..	20 (74%)	7 (26%)	—	—
V.	Good.	7	9	—	16
	Fair.	3	5	—	8
	Poor.	2	—	—	2
	V. poor.	—	—	—	—
	Total ..	12 (46%)	14 (54%)	—	—
Total		190 (54%)	82 (24%)	74 (21%)	—
Total types of home.	Good 153 (44%)	Fair 73 (21%)	Poor 52 (15%)	Very poor 68 (20%)	

Classification of Types of Homes.—"Good" implies the respectable artisan or middle-class household, where diet and hygienic conditions are reasonably good. "Fair" implies the artisan home where the diet is adequate but hygienic conditions not very good, probably from causes over which the parents have no control. "Poor" implies the home where the income is inadequate and diet and hygiene both very defective. "Very poor" means the home below the poverty line where the diet is most inadequate, in quality if not in quantity, and the hygiene very bad.

General Health.

In 271 cases the records were sufficiently complete to make it possible to estimate the degree of improvement obtained in general health. In order to eliminate any criticism, the greatest care was exercised in the classification, and if any doubt existed the case was not placed in the "improved" class. The totals show surprisingly good results, considering the severity of the classification. A very high proportion (83 per cent.) improved, and no less than 37 per cent. showed marked improvement and 6 per cent. striking improvement. In each individual group there was a definite improvement in over 80 per cent. of the cases, except in the mismanaged group, where it is a question

of affecting the mother rather than the child. The catarrhal cases included some with enlarged tonsils and adenoids awaiting operation (the delay usually amounts to three months after the child is placed on the waiting-list), and the improvement in health obtained by light treatment in this period is of definite value, though it would be preferable to avoid the delay in most cases.

The malnutrition cases received a certain amount of advice in addition to light treatment but these, as well as the majority of other cases, had already been under the care of the child welfare centres for some time and were sent as failing to improve.

The rickets cases are classified not in relation to rickets, but in relation to general health. The rickets, of course, healed in every case, but in very poor homes the general health does not improve concurrently, and it will be seen that in two cases there was no

TABLE IV.

Condition.	Cases.	Total improving.	Improvement.	Improvement—		
				Marked.	Striking.	None.
Gen. debility..	86	76 (88%)	29 (34%)	39 (45%)	8 (9%)	10 (12%)
Catarrhal cases	75	61 (81%)	32 (43%)	25 (33%)	4 (5%)	14 (18%)
Malnutrition ..	20	17 (85%)	10 (50%)	7 (35%)	—	3 (15%)
Rickets	32	30 (93%)	12 (37%)	14 (44%)	4 (12%)	2 (6%)
Debility due to mismanagement	24	13 (54%)	10 (42%)	3 (12%)	—	11 (46%)
Amyotonia ..	14	14 (100%)	8 (57%)	4 (29%)	2 (14%)	—
Nervous excitability	11	9 (82%)	2 (18%)	7 (64%)	—	2 (18%)
Total	262	220 (83%)	103 (39%)	99 (37%)	18 (6%)	42 (16%)

improvement. The total number of rickets cases treated during the year was 293, and the small number included here is due to the incomplete records in this group. However, the results obtained are better than with cod-liver oil in home treatment; as a rule, the mothers bring their children for treatment but will not trouble to come for the final medical examination. With cod-liver oil the rapid improvement of nervous symptoms is not obtained and the mothers do not persevere with the treatment.

TABLE V.—*Effects on Particular Symptoms.*

Symptom.	Cases.	Total improving.	Improvement.	Improvement—		
				Marked.	Striking.	None.
Appetite ..	120	93 (78%)	49 (41%)	38 (32%)	6 (5%)	27 (22%)
Sleep	77	59 (77%)	22 (29%)	29 (38%)	8 (10%)	18 (23%)
Nervous condition ..	76	50 (66%)	22 (29%)	20 (26%)	8 (11%)	26 (34%)
Flabby muscles	71	58 (82%)	31 (44%)	26 (37%)	1 (1%)	13 (18%)
Total	344	260	124	133	23	184

Four symptoms were studied: anorexia, sleeplessness, nervous excitability (fretfulness, bad temper), and lack of muscle tone. The result obtained was usually good, though 18 per cent. to 34 per cent. of cases in which there was failure to obtain improvement are noted. It must, however, be remembered that the mismanaged group is included, and without change of environment these are little affected.

Conclusion.

Careful observation of the effects of light treatment on city children gives definitely encouraging results. The curative effects of ultra-violet light on rickets is an established fact. Whether it is of real value in other directions remains to be proved. On young children, at the period of life where light deprivation is most common in cities, it appears to act as a definite stimulant to metabolism. The effect on nervous symptoms is particularly interesting and very well marked. Is it possible to suppose that a more effective elimination of fatigue toxins is secured?

The well-marked effect on weight is striking. The height records were not sufficiently accurate to quote, but it is probable that the increase in weight is associated with increased growth.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdr. R. W. Nesbitt to be Surg. Comdr.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Sub.-Lt. J. M. Ridyard to be Surg. Sub.-Lt.

ROYAL ARMY MEDICAL CORPS.

Capt. M. C. Paterson to be Maj. (prov.).
Capt. J. F. Wilde relinquishes his temp. commn.
Lt. F. McL. Richardson to be Capt. (prov.).

TERRITORIAL ARMY.

H. C. M. Williams to be Lt.
Capt. G. Whittaker to comd. 8th (Lond.) Hygiene Co

ARMY DENTAL CORPS.

Capt. L. Somerville-Woodiwis to be Maj.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Capt. G. Eager, from Active List, to be Capt.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 5TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox 457 (last week 449); scarlet fever, 2426; diphtheria 1464; enteric fever, 54; pneumonia, 1536; puerpera fever, 46; puerperal pyrexia, 102; cerebro-spina fever, 22; acute poliomyelitis, 1; acute polio encephalitis, 5; encephalitis lethargica, 14; dysentery 9; ophthalmia neonatorum, 118. No case of cholera plague, or typhus fever was notified during the week

The number of cases in the Infectious Hospitals of th Metropolitan Asylums Board on April 8th–9th was a follows:—Small-pox, 582 under treatment, 23 unde observation (last week 570 and 28 respectively); scarle fever, 2114; diphtheria, 2754; enteric fever, 21; measles 1057; whooping-cough, 70; puerperal fever, 30 (plu 18 babies); encephalitis lethargica, 121; poliomyelitis, 2 "other diseases," 22. At St. Margaret's Hospital ther were 15 babies (plus 7 mothers) with ophthalmia neonatorum

Deaths.—In the aggregate of great towns includin London there was 1 death from small-pox, 3 (0 from enteric fever, 134 (69) from measles, 9 (1) fron scarlet fever, 30 (4) from whooping-cough, 51 (6) fron diphtheria, 45 (15) from diarrhœa and enteriti under two years, and 61 (13) from influenza. Th figures in parentheses are those for London itself.

The death provisionally classified to small-pox wa assigned to Stepney (Met. Boro.). The deaths from enteri fever were reported from Dudley, Southport, and Hul Fatal cases of measles were again widely distributed, wit larger numbers at Manchester, 6; West Ham and Cheste each 4. Whooping-cough claimed 4 victims at Birmingham diphtheria 9 at Liverpool. Diarrhœa accounted for deaths at Birmingham and 4 at Liverpool. Birmingha and Swansea each reported 4 deaths from influenza.

The number of stillbirths notified during the wee was 275 (corresponding to a rate of 41 per 100 births), including 53 in London.

POST-GRADUATE MEDICAL EDUCATION.

THE committee appointed by the Ministry of Health in July, 1925, to draw up a practicable scheme of post-graduate medical education in London have now presented their report.[1] They begin by sketching the history of the subject and the present urgency of the problem. The lack of adequate provision for instruction in public health and for research in preventive medicine was remedied in 1922 by the establishment of the London School of Hygiene and Tropical Medicine, which was made possible by a gift from the Rockefeller Foundation. A defect that still remains is the absence of any hospital and medical school exclusively devoted to providing practical courses for doctors who wish to refresh their knowledge, learn about new developments, or participate in the clinical practice of a hospital. The committee urge the imperial, international, and national value of a British Post-graduate Medical School and its special value to the country doctor. They set themselves to establish, in the words of their terms of reference, "a practicable scheme" and have therefore not attempted to recommend anything too ideal to be translated into practical effect within a reasonable time. The scheme, they felt, must include a hospital, already large and capable of expansion, with the regular and ready provision of a substantial and increasing sum for its maintenance. It must also include the provision and maintenance of a medical school with staff, equipment, and premises at no point inferior to the best obtainable.

Schemes Considered but not Recommended.

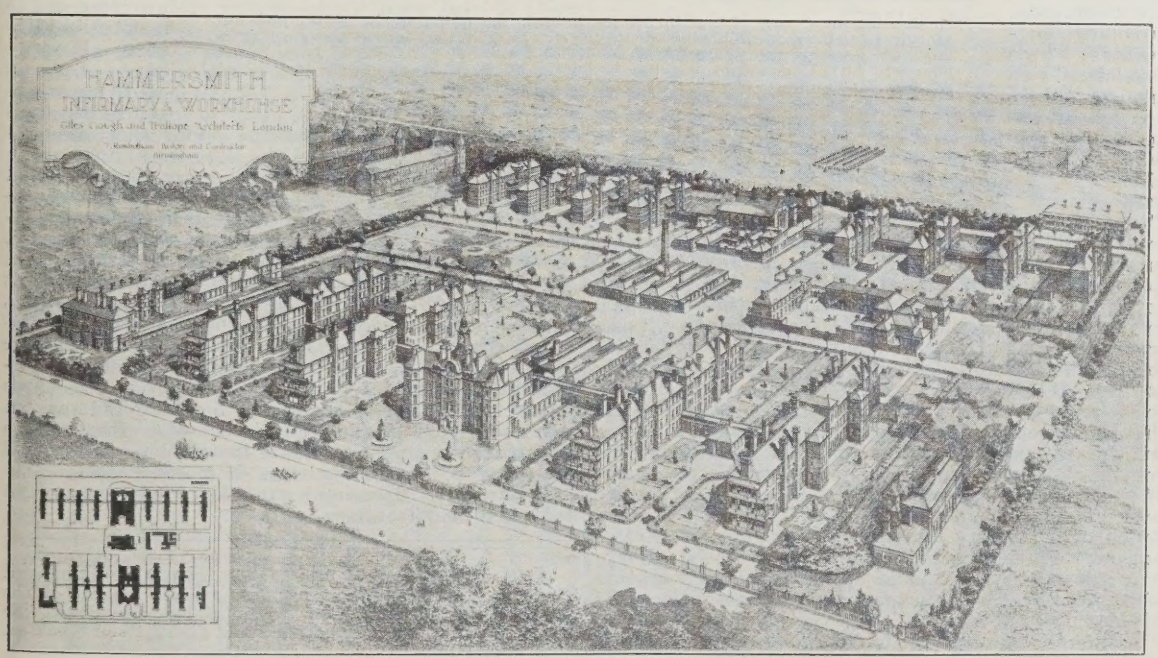
The committee considered first the building and maintenance of a new institution. This would have had the obvious advantages that site, design, and equipment could have been chosen in the light of most modern advice and that ample room could be provided for expansion. The committee soon realised, however, that this could not be called a practicable scheme, as its cost would delay its completion, at least for a considerable time. The committee felt it essential to have at least 400 beds available very soon after the inauguration of the scheme. They reckoned that the cost of the construction of the new building could not be estimated at less than £500,000, while the cost of maintenance would be not less than £100,000.

Secondly, the committee considered turning some existing hospital and medical school into the post-graduate centre. This would have preserved the traditions and reputation of an existing school, would have enlisted the help of a medical staff of high calibre and an enthusiastic group of lay supporters, would have ensured a building conveniently located and already serving a large area, and would not have involved the expenditure of large sums on bricks and mortar. The committee felt quite definitely, however, that undergraduate teaching must cease in the selected hospital and school, and they found that no suitable hospital was willing to accept this condition.

Thirdly, there was the possibility of using one of the existing voluntary hospitals without medical schools. The West London Hospital at Hammersmith was considered with especial care, as post-graduate medical education has been provided there since 1892. When the board of management of the hospital were informed that the committee desired the post-graduate institution to have 400 beds and that the board were to be held responsible for their maintenance, they viewed their financial responsibility very gravely but accepted it in principle. Detailed discussions proceeded, and it was estimated that about £350,000 would be needed to convert the hospital into a post-graduate centre and another

[1] Report of the Post-Graduate Medical Education Committee. H.M. Stationery Office. 1930. Pp. 37. 9*d*.

THE PROPOSED POST-GRADUATE MEDICAL CENTRE FOR LONDON.



A bird's-eye view of the Hammersmith Infirmary and Workhouse as it was planned in 1905 by the architects, Messrs. Giles, Gough, and Trollope (28, Craven-street, London, W.C.2), but which was not fully carried out from reasons of economy. The illustration is, however, of interest as indicating the lines on which the buildings lend themselves to completion. The actual lay-out may be seen on the map overpage reproduced from Stanford's Atlas of London. The northern block of buildings is the workhouse, now called the Hammersmith Institution, and the southern block is the infirmary, now called the Hammersmith Hospital. All the buildings were requisitioned as a hospital during the late war, and remained in use as the Special Surgical Hospital of the Ministry of Pensions from 1918 to 1924. The whole of the institution is under medical direction, Dr. J. Jenkins being superintendent of the hospital and assistant master of the institution.

£50,000 to equip the hospital and school. The cost of maintenance would probably prove to be about £100,000 per annum. The financial difficulties before the Board were therefore serious, but the scheme was apparently the only practicable one. While everybody concerned was hesitating, the committee found themselves faced early in 1929 with another possibility, involved in the proposed Local Government Act. They realised that when the Act became law nearly thirty public hospitals would be transferred to the London County Council, and the possibility of using one of these public hospitals for their post-graduate scheme could not be ignored.

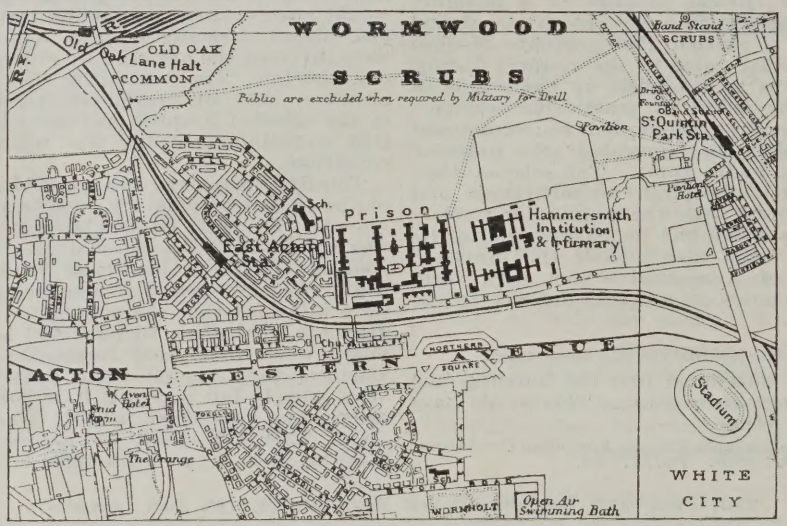
The Scheme Recommended.

After considering the public hospitals available and excluding the unsuitable ones, the committee reduced the possibilities to six and then to two, and finally selected the Hammersmith Hospital, which is situated in Ducane-road, Shepherd's Bush, on a site of 14 acres. It was built in 1905 and has 400 beds, of which 334 are at present medical and surgical, 15 gynæcological and obstetric, and 50 pædiatric. There is a resident medical superintendent and four assistant officers, with a consulting staff of six surgeons, two ophthalmologists, two physicians, two dermatologists, two bacteriologists, a dentist, and a radiographer. There is thus ready to hand a relatively modern building which is exceptionally well laid out for its purpose and has the requisite number of beds. The committee feel that this gives them an asset equivalent in value to a large part of the capital sum which would otherwise have to be found. They cannot submit an accurate estimate, but they do not think that it ought to cost more than £250,000 to convert the Hammersmith Hospital into a post-graduate institution, to equip it, and to provide residential accommodation, partly there and partly at a hostel elsewhere. The committee are unable to see any reason why the maintenance of the hospital should not remain, as it would do otherwise, a charge on the ratepayers of London. The hospital will continue to be a public hospital for the sick poor of the city, and the committee do not feel that its association with the British Post-graduate Medical School will lay any increased charge upon the ratepayers. If there should be any increased charge it will be more than made up for by the restoration of patients to earning capacity and the development of medical knowledge.

Although the committee regarded their financial problem very seriously they have by no means sacrificed the medical and administrative points of view. The Hammersmith Hospital serves a large area on the west side of London with a population which is already dense and is still increasing, and does not share with the West London Hospital the disadvantage of admitting a very high proportion of surgical casualties. The clinical material provided should therefore be just what is required. Since the London County Council has only just come into possession of the hospital it is obvious that a detailed scheme for a system of government has not yet been discussed. The committee, however, thought it better to submit their general scheme for acceptance before entering into the difficulties of administration. Another advantage of this hospital is the space around it, which leaves ample room for building a medical school and for any expansion which may be necessary. The West London Hospital has only two and a half acres of land.

The Hostel and Special Departments.

The committee think it best to build a hostel at some central spot within easy reach of the London School of Hygiene and Tropical Medicine, the other London hospitals, and the centres of recreation and social amenities. They hope to find a place which can easily be reached by road and rail from the Hammersmith Hospital. The Central London Railway, which serves Hammersmith, will be particularly convenient for students, as it also passes close to hospitals where special courses are likely to be provided and to institutions like the Royal Society of Medicine where students will look for medical literature and other aids to study.



Map showing on a scale of four inches to the mile the position of the Hammersmith Hospital and its accessibility by the Ealing extension of the Central London Railway with (at present) the nearest station of East Acton. St. Quintin Park Station connects with Kensington and Earls Court. Western-avenue is the new arterial road out of London.

Although special courses can be provided at special hospitals the committee considers that the centre itself will not be complete unless it includes departments for the study of tuberculosis, venereal disease, antenatal and postnatal conditions in women, and radiology. The Hammersmith Hospital has at present X ray and electrotherapeutic departments, a modern maternity ward with 16 beds, and an antenatal clinic. It has, however, no tuberculosis or venereal disease department and no organised out-patient department. The provision of these three departments must therefore be accepted as an inevitable part of the capital cost of converting the hospital into a post-graduate institution. There will also have to be a new nurses' home to accommodate 100 nurses at first, and capable of enlargement to take 200 or 250 nurses.

THE HOSPITAL BREAKFAST HOUR.—Warneford Hospital, Leamington, in response to the request of the majority of the staff and patients, has abandoned the new practice of washing patients and giving them breakfast at a later hour.

PRINCESS CHRISTIAN MATERNITY HOME.—Princess Helena Victoria, daughter of the founder, has opened an extension of this Windsor Home, an adjoining house having been purchased to provide additional accommodation. The King, who has hitherto made a grant of £100 a year from the State Apartments Fund, has increased the annual grant to £300.

Correspondence.

"Audi alteram partem."

PHYSICAL TREATMENT CENTRES.

To the Editor of THE LANCET.

SIR,—In his Milroy Lecture, reported in your issue of April 5th, Dr. Alison Glover alludes to the new Regent's Park Physical Treatment Centre, and also mentions the work of centres already existing in Kensington and Sheffield. He describes the Regent's Park Centre as capable of dealing with 400 patients a day. The Edgar Allen Institute, Sheffield, which covers a clinical field similar to that of the Regent's Park Centre, and which was inaugurated before the war, has for many years been called upon to treat considerably more than 400 cases daily; indeed, it has treated over 600 cases in a single day. In medical matters too much regard should not be given to arithmetical considerations; but in view of the fact that patients are only accepted at the Edgar Allen Institute on the advice of their own doctors, the figures given may be of interest as indicating the widespread demand for physical treatment.

I am, Sir, yours faithfully,

R. G. ABERCROMBIE, M.D.,
Medical Director, Edgar Allen Institute,
Sheffield.

April 11th, 1930.

"THE BLOOD PICTURE AND ITS CLINICAL SIGNIFICANCE."

To the Editor of THE LANCET.

SIR,—The review of Prof. Schilling's book which appeared in your issue of April 5th (p. 754) may be not unfairly critical of the English translation or even of the original German edition. But as one who is at present working with Prof. Schilling I should like to be permitted the opportunity of mentioning a few points which may help to allow a clear conception of this work to be formed.

The method of blood examination described has been for many years and is the routine method in use here at the Charité in Berlin, in the majority of the teaching hospitals and private clinics, and in the consulting rooms of many physicians in Germany. The method is simple and briefly is as follows: Two clean slides are taken—on the one, two thick smears are made, each consisting of three to four drops of blood, on the other slide a normal thin blood smear is made. In routine practice these are taken home and allowed to dry. Then the thick-drop preparation is stained with Giemsa reagent, the film is fixed with alcohol and then stained. The thick-drop slide is examined under the microscope for eosinophil leucocyte cells, for polychromatic erythrocytes, the remnants of which are visible as delicate blue networks lying between the leucocytes. They are present almost without exception in cases of anæmia but are rarely found in normal adult blood. Net-forms, torn net-forms, and dot-like dissolution (basophilic punctation) are noted, and considered as evidence of toxicity. The coarser forms are of value in the diagnosis of lead poisoning. The stained film then is taken, examined under the low power of the microscope, and an approximate estimation of the number of erythrocytes made with special attention to their size, intensity of colour, and shape. The leucocytes in a few fields are noted and classified as to whether they appear in normal ratio to the erythrocytes, markedly decreased in number, somewhat increased or greatly increased. In practice after examining a few films, one can judge the number of leucocytes so that the estimate should not differ from that of a full leucocyte blood count by more than 2000 to 3000 per c.mm. Then under the high power a differential count of 100 leucocytes is made. Four fields are taken and 25 cells counted in each field. They are noted on a special chart under the heading of basophiles, eosinophils, neutrophils, which are divided into myelocytes, juvenile, "stab," and segmented forms, lymphocytes and monocytes. The percentage count of the various forms of cells is taken and unless special abnormalities have been found, such as marked poikilocytosis, anisocytosis, &c., denoting a severe anæmia in which a full red cell count and hæmoglobin percentage estimation is suggested, the routine examination is concluded.

The smears take but five minutes to make; the films can be stained at any later time, and then within half an hour, and the blood count takes ten minutes. This method gives the clinician a good indication of the blood picture at the time of examination and in practice is done frequently and where in the majority of cases a full blood count would not have been undertaken. It is not possible for me to discuss here the value of the blood picture, but the presence of eosinophils as seen in the thick drop or the presence of many juvenile or stab neutrophils, a shift-to-the-left (Arneth), suggesting a rapid severe regenerative process often without any evidence of a leucocytosis is of value in the diagnosis of an obscure sepsis or the course of an infective process.

In brief, Prof. Schilling has made practical a method of blood examination that can be carried out in routine practice. The blood sedimentation test is carried out as a routine by the ward clerks, as are the blood counts. It is a simple method, and is recognised as of undoubted value in the recognition of active pyogenic infection, of neoplasms, and repeated estimations are of especial prognostic value, for example, in watching the course of an individual case of pulmonary tuberculosis. The guttadiaphot is as yet in the experimental stage. Personally I am investigating certain aspects of rheumatic diseases, and I feel this method of blood examination may be of value in giving further evidence on which, at a given time, the diagnosis of activity or inactivity of an infective process may be made.

I am, Sir, yours faithfully,

FRANCIS BACH, M.D. Oxf.,
Chadwick Travelling Scholar.

The Charité, Berlin, April 7th, 1930.

CLINICAL RESEARCH.

To the Editor of THE LANCET.

SIR,—"M.D., F.R.S. Edin." has mistaken my meaning when I said "there seem to be several equally effective methods of treating the same disease," and perhaps he will be kind enough to read the letter again. Or possibly from his own experience he can tell us whether chemotherapy, rectal permanganate, specific vaccines or, what I recently witnessed, keeping the patient drunk with brandy, is the best way of treating pneumonia. Treatment is the primary business of the general practitioner for three reasons: first, because it is the patient's one and only object for coming to see us at all; secondly, because, although we see a good many cases each day, we see each patient several times, and diagnosis is only necessary the first time; and, thirdly, because diagnosis is easy in the majority of cases, or has already been made for us by a consultant.

It is always possible to recall straightforward cases where other men have made a wrong diagnosis. I myself recently saw a man with tabes who had been treated for three years, by a colleague whom I respect, for sciatica; and there are few pleasures in life equal to that of pulling the mote out of our brother's eye. But if that colleague were to take over my practice I have little doubt he would find a beam in my own eye. The reason for such an error is inherent in human nature; my colleague knew as much or more about tabes than I do, but when he first saw the patient the disease was too slight to be recognised, and the patient usually denies infection unless he thinks the

doctor has already found it out for himself. A tentative diagnosis is made and the pains are alleviated by a simple remedy; the working hypothesis gradually becomes fixed in his mind; "trifles light as air" become "confirmations strong as proofs of Holy Writ." Nothing is so difficult as to review a case one has treated on and off for several years. But by the time the patient gets to Doctor No. 4 the diagnosis is obvious to a fourth-year student.

Nervous diseases are the happy hunting ground of the diagnostician; but they are quite exceptional in general practice, and we can easily recognise them as out of our ken (if that is the case) and send them to a consultant, who will rejoice exceedingly if he finds an "organic" disease; if it is "functional" he will treat it with contempt and leave us to treat the patient, quite oblivious of the fact that functional disease is much more serious to the sufferer than most organic diseases; true, he may not die of it, but he makes life a misery to himself and others, which is worse.

I ended my letter by suggesting that an attempt be made to discover which are the common diseases and that they be studied first.

I am, Sir, yours faithfully,

FREWEN MOOR, M.D.

Westgate-on-Sea, April 10th, 1930.

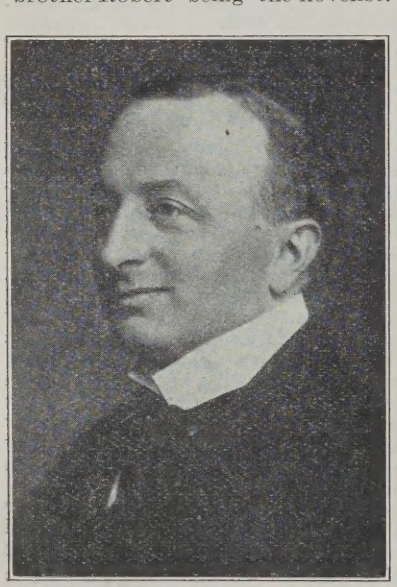
Obituary.

PEVERELL SMYTHE HICHENS, D.M. OXF., F.R.C.P. LOND.,

CONSULTING PHYSICIAN TO THE GENERAL HOSPITAL, NORTHAMPTON.

THE news of the death of Dr. Hichens, which occurred on March 28th, came as a great sorrow to his many friends. Since his retirement from practice in 1924 he had lived in Guernsey and for the last 18 months was increasingly an invalid.

Peverell Smythe Hichens was born at Speldhurst, Kent, in 1870, the second son of the Rev. Canon F. Hichens, rector of St. Stephen's, Canterbury, his elder brother Robert being the novelist. He was educated at King's School, Canterbury, Clifton College, and Magdalen College, Oxford. From there he went to St. Thomas's Hospital in 1892, and took his B.M. at Oxford in 1895. After demonstrating pathology and surgery, and holding resident appointments at his own hospital and at Brompton, he developed symptoms of lung trouble and spent a year or more at Nordrach, in the Black Forest, where Otto Walther's methods were just beginning to attract attention. In 1901 he was appointed physician to the General Hospital, Northampton, and soon acquired a good consulting practice in the town and country. In 1903 he took his D.M. at Oxford, and in 1911 was elected a Fellow of the Royal College of Physicians, having been a Member since 1899. His interest in tuberculosis was quickened by the honourable mention he obtained for his essay for the King's Sanatorium Prize in 1902, and in the following year he published an important paper on sanatorium treatment with special reference to Nordrach methods, with which a prolonged personal experience had made him familiar. At once he began to awaken local interest in the foundation of an institution for the open-air treatment of tuberculosis and his efforts were finally crowned with success when, in 1909, the county sanatorium was opened at Creaton and he was appointed its consulting physician. Of his work an old colleague at the hospital writes: "I know how sound Hichens was in his judgment of a case and how conscientious and painstaking he was in anything he undertook. I think he liked sometimes to regard himself as old-fashioned and to affect a regret that the art of medicine was becoming increasingly complicated by fresh methods and fresh discoveries. Of these, however, he was always among the first to make use." His war service was distinguished. Under the old territorial hospital scheme he was a major attached to the 1st Eastern General Hospital at Cambridge, but he quickly managed to exchange from this into a field ambulance and got to France in 1915. There he was in command, first of a casualty clearing station and subsequently of a general hospital at Calais. He was not demobilised until the summer of 1919.



DR. HICHENS.

His chief interest outside medicine was in the Church and all the time he was in Northampton he did a great deal of hard work as vicar's warden at All Saints' Church. He was a man of considerable general culture. He read constantly and knew his English literature well; he had a wide knowledge of music and was a good pianist, while every holiday produced some charming water-colour sketches. The same colleague writes: "I always think of him as rather old for his years. This may have been due to a slightly pedantic manner, but with this was combined a constant kindly courtesy which made him liked and respected by everyone with whom he came into contact."

In 1906 Dr. Hichens married Constance, daughter of Lieut.-Colonel L. Downes, and he leaves a widow, a married daughter, and a son

HERBERT JAMES ILOTT, M.D. ABERD.

Dr. H. J. Ilott, who died at Midhurst on April 3rd at the age of 77, was formerly one of the best known practitioners in Kent and came of a medical family which has been associated with Bromley for over 200 years. His ability was early shown by his achievements as a student at St. Bartholomew's Hospital, where in 1872 he was senior scholar in medicine, surgery, and midwifery, and in 1873 won the Kirke's gold medal for clinical medicine. A year later he graduated at Aberdeen with highest honours, and after a period as house surgeon at Croydon General Hospital settled down in the family practice at Bromley. Here the remainder of his professional life was spent, and it was not until a few years ago that he retired and went to live at Midhurst. He was lately elected Master of the Society of Apothecaries, but failing health prevented him from undertaking the duties.

Dr. Ilott leaves a widow, with a son and a daughter.

COVENTRY AND WARWICKSHIRE HOSPITAL.—The number of in-patients increased last year by nearly 300, and out-patients were more numerous by over 2000. In 1910 there were 1433 in-patients; last year the number was 5099. At £6 17*s.* 10*d.* last year the average cost of an in-patient was 6*s.* 3*d.* less than in 1928. The cost of each patient at the Alcock Convalescent Hospital (average stay 17·5 days) was £4 5*s.*, an average of 4*s.* 10*d.* per day.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

MENTAL TREATMENT BILL.

ON April 11th the House of Commons considered the Mental Treatment Bill on report.

Power to Receive Voluntary Patients.

On Clause 1, Dr. VERNON DAVIES moved to delete from the first Subsection the words "for mental illness." He said that the elimination of these words would not have a detrimental effect on the Bill, and would simply bring it into line with the Lunacy Act. He thought that the amendment would have a very material effect in encouraging people to come at the earliest moment to submit themselves to treatment.

Mr. GREENWOOD (Minister of Health) said there was nothing derogatory in describing in a Bill the plain fact about the disease from which a person was suffering. They must define diseases, and there could not be any words less objectionable and more neutral than the term "mental illness." There was a difference of medical opinion on this matter, as was shown in Committee, and therefore it was better to retain the words. He did not think that voluntary patients would be deterred by them from seeking treatment. Already they went in large numbers to these institutions.

The amendment was negatived.

The Board of Control and the New Service.

Mr. KINLEY moved an amendment to dissociate the Board of Control from any connexion, direct or indirect, with the new service for the treatment of voluntary patients, and to substitute for the Board the Minister of Health. He said that the amendment was of fundamental importance, and on the decision of the House upon it would depend whether the Bill would be of real value to the public. He (Mr. Kinley) was whole-heartedly in favour of this new public health service for the prevention of lunacy, but he held that the Board of Control should have nothing whatever to do with it, otherwise it would be doomed to failure. The Board of Control have been condemned in the public mind for many years, and that condemnation had been lately justified because the Royal Commission had stated that the Board as hitherto constituted was not worthy of continued existence. Fundamental alterations in the constitution of the Board were proposed in this Bill. He did not say that the individuals who comprised the Board of Control had been responsible for the failure, but he did suggest that the record of their work so far as they could ascertain from statistics proved that if there was one thing that was important in their public health service it was that the Board should not be permitted to enlarge its scope until it could prove to the nation by results that the power it possessed had been well used. From all that he could discover there was no justification for any statement that the Board had been successful. He was amazed that long before now there had not been a minute and severe investigation into the whole of the operations of the Board. In answer to questions addressed to the Minister of Health during the last few weeks he had ascertained that on the average 22,000 people were admitted to asylums every year, and that over 30 per cent. of these were recorded as deaths within 12 months. Over a period of ten years out of the 22,000 admitted each year, 10,000 were discharged, and 8000 or 9000 died. Over the same period the number of suicides had increased from 49 in the first of the ten years to 61 in the last year; another reason sufficient to condemn the Board of Control. According to a reply given to him only a week ago by the Minister of Health, in the publicly owned institutions the patients had the advantage of the service of a resident medical officer to the extent of one doctor for 280 patients. Under no circumstances could the arrangement ever give the results that they were entitled to demand.

Mr. MESSER, in seconding the amendment, said that the Board of Control had outlived its usefulness at least in the eyes of the public authorities who had been appointed under the Ministry of Health to discharge the functions necessary in dealing with mental cases. The Board was necessary in the days when private institutions were the only ones dealing with cases of this kind, and when it was necessary in the public interest that there should be close examination of all complaints concerning institutions for mental treatment. But as time had gone on county councils had found the Board of Control not a help, but a hindrance.

Sir KINGSLEY WOOD said there was not a word in the report of the Royal Commission to support the rather reckless statements that had been made that day. The proposal of the amendment to substitute the Minister of Health for the Board of Control in regard to these voluntary mental patients involved considerable administrative difficulty. It would mean a duplication of machinery and of staffs which would be very unfortunate unless there was overwhelming necessity for it. He thought that the Board of Control would give a measure of protection to the persons who took advantage of the treatment under this Bill. He hoped that it would be possible for the Minister to retain the lay element on the Board of Control, as it would strengthen the Board in the eyes of the public.

Colonel WEDGWOOD begged the House to consider that the liberty of the subject was one of the most sacred charges upon every Member of Parliament. Every British citizen should have at least some appeal to a court to escape from the control of the expert and the bureaucrat.

A Defence of the Board.

Dr. MORRIS-JONES said that Colonel Wedgwood objected to mental patients being treated by an expert. Who did he suggest should treat them? The right hon. gentleman, he assumed, to save his life would submit to a grave operation at the hands of a surgeon, but he would not trust a medical commissioner in lunacy.

Colonel WEDGWOOD: I should choose my own surgeon.

Dr. MORRIS-JONES said that liberty, after all, was a limited matter, and he was sorry to hear the very strong remarks that had been made about the Board of Control. He realised that Mr. Kinley had moved this amendment quite sincerely, but he suggested that he was entirely misinformed and misguided, and he had made references to a body which was doing very difficult work which were not worthy of his work during the committee stage. The Board of Control were dealing with thousands of people, not one of whom was normal mentally, and he (Dr. Morris-Jones) thought they had done their work extraordinarily well in the circumstances. Their name was unfortunate. The British people did not like the word "Control," and it was very unfortunate that in 1913 they were given the name of "Board of Control." He would read to the House the views of a great expert, Sir Maurice Craig, on the Board. Sir Maurice had stated:—

"I am aware that there is a diversity of opinion as to who should be the central authority responsible for supervising patients in the early stages of mental disorder. For many years I felt, with others, that the Board of Control were too much steeped in the traditional treatment of mental disorder, and that it might be difficult for them to free themselves from this outlook, and in consequence I feared it might, in practice, be difficult to have the body visiting patients who are not insane. But it has been impossible to watch the work of the Board of Control during recent years without appreciating how much they have taken up the more modern views of psychological medicine, indeed, they have shown such power of adapting their functions to the medical outlook and I am now of opinion that this body is fitted to undertake the supervision of all mental patients, including those in the early stages of illness."

That was an unbiased opinion. This was the conclusion which the Royal Commission came to in regard to the Board:—

"We are satisfied that the criticisms to which this Department has been subjected are to a large extent ill-informed, and that where criticism is justified the cause is to be found rather in defects in the existing system than in any want of zeal on the part of members of the Board. Having had opportunities of observing the care and thoroughness with which their work is done and the wide scope of their activities and their vigilance, we think that the Board have discharged their duties under the present code in a manner deserving of great commendation; but they are handicapped by three factors beyond their control."

That was a very fitting and unimpartial testimony to the Board of Control. Voluntary patients under this Bill would gain tremendously from the protection afforded by the Board of Control. It was amazing to him that the Board should be so constantly assailed on all sides. He was sure that they were quite prepared to go on doing their work conscientiously in spite of any criticism. He (Dr. Morris-Jones) had great hopes in regard to Clause 1. Medical men would make great use of it, and try to get patients voluntarily to seek early treatment.

Non-Certifiable Treatment for the Masses.

Mr. GREENWOOD said that Clause 1 did not represent the views of bureaucrats or experts, but the conclusions of the Royal Commission. The voluntary patient had existed under the law for a considerable time, and all that they were trying to do in this Bill was to render this early form of non-certifiable treatment, which at present was available only for the well-to-do, available also for the mass of the people. The experience of the voluntary patient system in the past showed that the Board of Control had really not been a force working against the success of the system. During 1929 there were admitted to registered hospitals 562 certified patients and 668 voluntary patients. In the

case of licensed houses, 974 certified patients were admitted and 757 voluntary patients. The point was that nearly one-half of the entrants into registered hospitals went in voluntarily. Therefore, there was not in the minds of these people that fear which had been suggested. By this amendment the House was not asked to abolish the Board of Control, or to supersede it by the Ministry of Health. That would require a very far-reaching Bill drastically amending the principal Act of 1890. Obviously that could not be done in this Bill, particularly at the present stage. What the amendment asked was that the Ministry of Health should be directly responsible for certain aspects of mental illness, whilst retaining the Board of Control for the major portion of the responsibility for such illness. That would mean that in most cases there would be going to the same institutions medical visitors of the Board of Control and of the Ministry of Health. There would be duplication of inspection and of administration. The problem was more complicated than that. Hon. Members must not suppose that the voluntary patient was in a category which was unalterable, or that if he came under Clause 5 he would always remain so, or that if he was certified he was certified for ever. These three categories of persons were ever-changing. Mental disease took many forms; it was more acute in some cases than others, and one form passed into another. It seemed to him bad administration to take one particular category of people suffering from mental illness and to say that they should be supervised by the Ministry of Health, and that the other categories should come under the supervision of the Board of Control. What were they going to do about the people who oscillated between one category and another? Hon. Members were asking for an administrative system which no Minister would pretend to work, because it would be utterly impracticable.

Mr. WOMERSLEY asked the Minister whether he would accept an amendment giving the local authorities a right of appeal to the Minister of Health against any decision of the Board of Control?

Mr. GREENWOOD: On that matter I stand precisely where I stood during the Committee stage.

Mr. BECKETT said that during the six years he had been a Member of the House he had been brought into touch with the Board of Control on a great number of occasions, and he could not remember a single case in which he had felt satisfied when the case was finished that the right thing had been done. He could not remember a case where the correspondence from the Board was, in his opinion, fair, honest or candid. His experience was that the Board always sought to detain persons under their control. In one case he was able to trace all their lies, their malevolence, their libellous statements and their maliciousness. He took the matter to the Ministry, and finally, by threats of publicity, he was able to get an apology. A case like that left a very uncomfortable feeling in the mind that in many cases in which he had failed, had he been able to get as much information as he did in this case, and had the Board of Control made one little slip in their facts, as they made in this case, he might have been able to do much more. His experience of the Board of Control had convinced him that it was permeated by the very worst type of charity organisation mentality. He wished they could have got the Minister to meet them on this point. No one said that this Bill was unnecessary; it would do a lot of good, but it was giving increased power to a body over which the House had no effective control, and in which a great many Members had no confidence.

Dr. VERNON DAVIES said that they had listened to a rather unfortunate speech in which a Member of the House had thought it necessary to make a distinct and deliberate charge against the Board of Control. The Board could not answer for themselves, and although he had no love for officials as a class, and believed that there was a great deal to be said against the introduction of a new despotism, he did not think that officials should be subjected to a charge in that House unless the Minister was given an opportunity to reply. He (Dr. Davies) could not agree to this amendment because one of his principal objections to the Bill was that it lowered the status of the Board of Control. Certain hon. Members seemed to have a wrong idea of the functions of the Board. It could almost be described as a judicial body. They acted as judges on all documents or medical certificates to see that they were absolutely in order. They were the guardians of the liberty of the subject. The power of a body like that should, if possible, be increased. To reduce them in status, as was being done under this Bill, by placing them under the Minister of Health, weakened their position. They would simply become a department of the Civil Service. He went further and said that they would have a new tyranny. If Members asked a question the Minister of Health would only tell them what he wanted them to know, or what his department wanted them to know.

The amendment was negatived by 205 votes to 18.

Mental Hospitals and Voluntary Patients.

Mr. WINTERTON moved an amendment to provide that unless a voluntary patient was of unsound mind within the meaning of the Lunacy Acts 1890 to 1922, he should not be received as a patient, either rate-aided or paying, in a public mental hospital. He asked whether the Government or anyone else who supported this Bill suggested that an ordinary lunatic asylum was the proper place in which to treat these patients? THE LANCET had said a little while ago: "If a person with mental disturbance voluntarily asks for treatment in a hospital or home, why should he more than any other invalid have to be notified to the Board of Control?" There seemed to be no ground whatever for saying that a voluntary patient should be treated in exactly the same way as a hopeless lunatic.

Mr. BROCKWAY seconded the amendment.

Miss LAWRENCE (Parliamentary Secretary to the Ministry of Health) said that these patients could no more be "sent" to any place than any Member of Parliament. They were not lunatics, but people who were a little worried about themselves, and they went into the institutions which dealt with all classes of cases, varying from lunacy to the mildest form of mental worry. There was no clear-cut distinction between a case of hopeless melancholia and a person who had become depressed. If that were so, what was the sense of saying that the same institution should not be allowed to treat the extreme forms of a disease and the mild forms of the same disease? She thought it very likely that, with the enormous amount of fresh institutions coming into the hands of the local authorities, where public opinion would allow it they might set apart separate buildings if they found a reluctance on the part of voluntary patients to go into the other mental institutions. But at present people did go to the mental hospitals.

Dr. VERNON DAVIES said at the present time there was no other accommodation for these patients except the mental hospitals, and though he was bitterly opposed to sending them to those hospitals, which were already overcrowded, he recognised the difficulty. Pressure must be exerted on the local authorities to supply other places for these people. Under the new Local Government Act, the borough or county councils could establish convalescent homes for these cases where they could be free from the ordinary asylum environment. But, of course, they would have to be under the care of a medical man with some experience of the subject. At present, however, they must include the mental hospitals as places for the accommodation of these cases.

Lieut.-Colonel FREMANTLE supported the views put forward by Miss Lawrence and Dr. Davies.

The amendment was negatived.

Notice of Reception, Death and Departure of Voluntary Patients, and Provisions as to the Discharge of Patients.

On Clause 2, Colonel WEDGWOOD moved an amendment which proposed to qualify the reference in Clause 1 to persons becoming incapable of expressing themselves as willing or unwilling to continue to receive treatment by requiring that they should be so incapable "in the opinion of a magistrate."

Mr. GREENWOOD said that he was in favour of the exclusion of magisterial interference to the greatest possible extent. The real objection to the intervention of a Justice of the Peace was that it had always been associated in the public mind with certification.

The amendment was negatived by 192 votes to 30.

The further consideration of the Bill on Report was adjourned.

POST-GRADUATE MEDICAL STUDY.

In the House of Commons on April 9th Mr. NEVILLE CHAMBERLAIN asked the Minister of Health what action the Government proposed to take on the Report of the Post-graduate Medical Education Committee.

Mr. GREENWOOD (Minister of Health) replied: In view of the public interest in this matter I hope that the House will permit me to make a statement which exceeds the usual limits of a reply to a question. The Committee was appointed by my predecessor. He was as Minister of Health its chairman and I succeeded him. The Report will be in the hands of Members to-day. The proposal of the Committee is that in order to remedy the most serious outstanding defect in the existing provision for the education in medicine of post-graduate students, a British Post-graduate Hospital and Medical School should be established in London.

Organisation and Financial Position.

The organisation of the British Post-graduate Hospital and Medical School recommended by the Committee consists

of an existing public hospital, the Hammersmith Hospital, with 400 beds in modern wards, which on April 1st became the property of the London County Council under the Local Government Act, 1929; a medical school in conjunction with the hospital; and a residential hostel on a site in central London. The Committee estimate that the financial provision required to establish and maintain the British Post-graduate Hospital and Medical School, apart from the cost of the maintenance of the beds in the public hospital, which in their view should remain, as it is now, a charge on the ratepayer, will be as follows: First, a capital sum not exceeding £250,000 for building a medical school, which together with the hospital will form the main part of the new organisation, and for providing educational equipment. Secondly, the sum necessary to maintain the medical school as a recognised school of the University of London. Thirdly, the capital cost of building the residential hostel. The Government have accepted the recommendations of the Committee as to the organisation of the British Post-graduate Hospital and Medical School. They are much impressed with the importance of securing without avoidable delay the advantages of a proper system of post-graduate medical education in London, not only from the domestic, but also from the Imperial and from the international points of view. The Government will, accordingly, be prepared to contribute from public funds a maximum sum of £250,000 for building and equipping the medical school as an integral part of the scheme recommended by the Committee; and to make provision for grants through the University of London towards the maintenance of the school on the lines already applied to comparable institutions of university rank. The Government earnestly hope that they may secure the coöperation of the London County Council and of the University of London in the scheme as recommended by the Committee, and they are entering into communication with those bodies on the subject.

"London House."

The Government understand that an appeal will shortly be made to the public for assistance in the establishment in London of a residential institution to be called "London House" for the use of students from the Dominions not only in medicine but in other arts and sciences. It is also part of the proposed scheme that "London House" shall offer accommodation to a limited number of British students domiciled in Great Britain and Northern Ireland in order to furnish collegiate association between them and students from the Dominions. Such an institution would, in fact, secure the object aimed at by the Post-graduate Medical Education Committee in recommending the provision of a hostel. The Government are in full sympathy with the movement and they look forward with full confidence to the success of the appeal when it is made as crowning a scheme to which the taxpayer, the ratepayer, and the general public will be contributing their appropriate shares

Expansion if Required.

Mr. CHAMBERLAIN: I am sure that the statement which the right hon. gentleman has just made will give profound satisfaction as soon as its full implications are appreciated. In congratulating him upon the final success—which I am sure he will agree is largely due to the very distinguished body of surgeons and physicians constituting the Committee—may I ask him whether the hospital which has been chosen is considered to have a sufficient number of beds for the purpose for which it is required, and whether, if not, there is room for extension if it is considered desirable?

Mr. GREENWOOD: Yes, Sir. The scheme envisaged by the Committee makes provision for a larger number of beds than is now available at Hammersmith. The Committee were unanimous in their choice of Hammersmith, and there is sufficient available ground for extension and the number of beds to make the hospital effective.

Mr. MARLEY asked whether it was proposed that colonial students as well as students from the Dominions would be able to reside at "London House," as there were post-graduate students from Africa taking courses in tropical medicine?

Mr. GREENWOOD: If I used the term Dominions narrowly I am sorry. The hostel will be available for students from all parts of the British Commonwealth.

In answer to Miss RATHBONE, Mr. GREENWOOD said that men and women would both be included in the scheme, but the scheme was intended for post-graduates and not for ordinary students. It was to assist people who already possessed qualifications.

Miss RATHBONE: Does the right hon. gentleman not think it likely that women students will be included among post-graduate students?

Mr. GREENWOOD: Yes, certainly.

HOUSING (SCOTLAND) BILL.

On April 10th, Mr. ADAMSON (Secretary of State for Scotland) in moving the second reading of the Housing (Scotland) Bill, said its object was to secure that the slums of Scotland, which had long been a standing reproach, should be done away with, and that in place thereof there should be houses of adequate size in which healthy, happy lives could be lived. The report of the Royal Commission on Housing in Scotland, which was issued in 1917, revealed a picture of the housing conditions in Scotland as a whole which showed unsatisfactory sites of houses and villages, insufficient supplies of water, unsatisfactory provision for drainage, inadequate provision for the removal of refuse, widespread absence of decent sanitary conveniences, houses in many of the mining areas badly constructed, incurably damp labourers' cottages on farms, whole townships unfit for human occupation in the crofting counties and islands, and primitive and casual provision for many of the seasonal workers. That Commission recommended that there were required in Scotland 121,430 houses to meet the needs of the people.

The Commission were not satisfied, however, with the standard of housing accepted at the time of their report, and they were strengthened in that opinion by a reference to the census figures which showed that half the houses in Scotland were of one and two rooms only. They recommended, therefore, the raising of the standard, and to achieve this it was estimated that an additional 114,560 houses were required or a total of 235,990 houses before the people of Scotland could be regarded as adequately housed. Each Government since the issue of the Commission's report had made its contribution to the solution of this problem, and although up to Feb. 28th last, the latest date for which returns were available, there had been provided under all forms of State assistance by local authorities and private enterprise a total of 107,451 houses. As it was estimated that 10,000 houses were required annually in Scotland to meet the normal needs and to provide for the new yearly demands, it would be realised that since 1919, when the first scheme of Government assistance was passed by Parliament, building operations had, on the average, only just kept pace with the normal needs of the Scottish people.

The Problem of the Slums.

However commendable the efforts of the local authorities up to date had been, the houses built had not succeeded to any extent in solving the problem of the slums, or the housing of the poorer section of the community. Some steps, however, had been taken in that direction with the aid of the 50 per cent. grant under the 1923 Act, and 11,205 houses had been built at low rents, specifically to take the place of houses which were occupied but were unfit for human habitation. This, however, was only a small contribution in comparison with the magnitude of the problem. In 1919 the local authorities in Scotland estimated that 34,755 houses were required to replace houses that should be closed, while 41,880 houses were required to relieve overcrowding. Recent available figures indicated that there were at least 13,000 houses occupied in Glasgow that should be closed; in Edinburgh over 5000; in Greenock about 14,000; in Dundee about 2000; and in Aberdeen about 1500; besides a large number in other parts of the country for which he would not attempt to give figures. Overcrowding was not confined to what were generally known as slum areas; it was just as common outside those areas, and in the interests of health, decency, and morality it must be prevented if possible. According to the latest census returns, more than 2,000,000 persons in Scotland, or over 43 per cent. of the population, were living more than two in one room.

Re-housing Grants.

The Bill proposed that grants should be given not only for the re-housing of persons displaced by the closing of uninhabitable houses, but also for those displaced by the operations of a local authority to abate overcrowding. The Government proposed to work through the local authorities, who would be given State assistance. Experience had shown that certain improvements in the machinery for clearing slums were necessary, and the Bill embodied those improvements. It was necessary to separate the clearance procedure from the development procedure, and this constituted the main difference between the procedure under the present law and that proposed under the Bill. Part I. of the Bill dealt with the clearance or improvement of unhealthy areas. Part II. dealt with the repair, demolition, or closing of insanitary houses. Under Part III. local authorities were required to consider the housing needs of their district from time to time, and as occasion arose, to submit proposals to the department for the provision of new houses. The financial proposals contained in Clauses 19 to 21 substituted for the present percentage grant a new

State grant which would take the form of a fixed sum per person displaced for whom re-housing had been provided consequent on the operations of the local authority under the Bill for the closure and demolition of defective houses, and the abatement of overcrowding. The amount of the assistance granted by the Exchequer, together with the contributions from local rates, would enable a local authority to provide houses for the larger families at rents suitable to their needs. The larger the number of apartments in a house, the larger would be the grant. To meet the demands of local authorities the grant would be available where they provided accommodation for single persons in hostels. In addition to the grant per person already referred to, there would be an additional grant to meet the expenses of local authorities who had to pay compensation for good property which had to be demolished under a clearance or compulsory purchase order.

Slum Clearance Schemes.

Major ELLIOT said that all Members of the House would sympathise with the objects which Mr. Adamson had in view in this Bill, but the measure would require close examination to see whether it actually carried out those objects. In Scotland slum clearance schemes had not suffered the entire collapse which apparently had been the case south of the border. On a population basis, local authorities in Scotland had done eight or ten times as much as had been done in England and Wales. Some 10 per cent. of all the housing in Scotland had been directed to the clearance of the slums. The opposition did not intend to challenge the second reading of this Bill, or the financial resolution which would be considered later. At the same time he was afraid that the financial proposals would cause apprehension in the minds of local authorities that they would not be very much better off under this Bill than they were before. The new machinery proposed seemed in some places to simplify the procedure, but he would like to get a little more milk for the bantling. He suggested to Mr. Adamson that he should once more approach the Treasury and not give way until he had got an assurance that the introduction and not the passing of this Bill should be the date from which the new grants would commence.

Mr. MACPHERSON said the Bill did not go far enough in compelling local authorities to take action.

Mr. BUCHANAN said that he welcomed the Bill and would do what he could to help in its passage, but he was under no illusion, representing the great mass of poor people, that there was any hope for them unless this or some other Government brought to those poor people the means of obtaining an income sufficient to meet their bodily and mental requirements.

The History of Scottish Slums.

Mr. BUCHAN said there were certain reasons for the special character of the Scottish slums which made it necessary to treat them as a separate problem from those of England, and one of those reasons lay in their history. The conditions of life in an older Scotland were very favourable to slum-making. They were a poor people, and did not enjoy a clement climate. They were for a very long time under a constant threat of invasion from the south, and so were compelled to huddle together for security. As a result they were not a very hygienic people. It was often forgotten that until the end of the eighteenth century the Scottish nobility and gentry in Edinburgh lived under slum conditions in horrid little flats without light or air, with a filthy common staircase, and in the streets heaps of offal and garbage, and pigs and hens running about them. Sir Walter Scott was born in a slum which would have horrified any modern reformer. He had six brothers and sisters who died in infancy because of these slum conditions. The first attempt at slum clearance in their history was the migration from the old to the new town of Edinburgh. The second reason for the special character of the Scottish slums lay in the way the industrial revolution came to Scotland. In a decade or two the whole face of the country was changed, and the balance between town and country was upset. Men and women were herded into new insanitary barracks, or into the overcrowded tenements of Glasgow or Edinburgh. There was little foresight in the whole business, and for a long time the country was entirely unaware of the problem. Before the national conscience awoke the problem had become almost insoluble. The result they know to-day. They had seen it only too clearly in unhealthy children and stunted men and women. The standard of height and physique of the Scottish soldier had had to be steadily lowered. There was another special character of the Scottish slums, and that was there was no slum clearance by natural causes. The old stone tenements of Glasgow or Edinburgh did not tumble down; they became yearly more filthy, but they remained standing. Some of the new barracks, which were now slums, were built on old greens and closes behind tenements back to back. The result was that slum clearance in Scotland must be a much more intricate and more drastic thing than in any other part of the kingdom. This Bill attempted to expedite the work of improvement, not a great deal, but a little. He found himself in general agreement with its provisions, and he hoped that it would speedily be passed into law.

After further debate the Bill was read a second time without a division.

The House afterwards went in Committee on the financial resolution connected with the Bill, and after some debate this was also agreed to.

MATERNITY AND CHILD WELFARE.

On March 31st, on the motion that the Speaker do leave the chair on the House of Commons going into Committee of Supply on the Civil Estimates and Estimates for Revenue Departments, 1930,

Sir KINGSLEY WOOD raised the question of maternity and child welfare. He said that so far as infantile mortality was concerned the country could congratulate itself on the position, but the maternal mortality-rate was nothing like so encouraging and caused a considerable amount of disquiet. A considerable improvement in the carrying on of the work in connexion with these two matters would be obtained by transferring it from the smaller local authorities to the larger bodies like the county councils. Under the larger authorities there was a school medical service. If they could coördinate the work in connexion with maternity and child welfare, and link it up with the larger authorities, they would secure coördination of that work with the school medical service of the local authority. That would be a very great gain, which would be lost if they relied on the smaller local authority. They would practically have continuity in the supervision of the health of the children from birth up to the school leaving age. There was no country in the world which was as proud of its voluntary institutions and of their work as was this country. All classes of the community joined in assisting the voluntary agencies and the voluntary hospitals. He hoped that the representative of the Ministry of Health would assure the House that the Ministry were going to assist in every way they possibly could the work both of the local authorities and the voluntary agencies. He was glad to see that one of the matters which arose in connexion with the Estimates was that of health visiting. That work was becoming more and more appreciated, and almost equally with the work of the medical man and the midwife. What steps had been taken in the last year to improve the training of midwives?

Maternity Services for Antenatal Clinics.

Miss LAWRENCE, Parliamentary Secretary to the Ministry of Health, in reply, said that it was stated that special money was required for infant welfare. That was one of the services which had been taken away from proportional expenditure and had been placed under the block grant, which was stereotyped for a term of years. They could not give any more money for that purpose unless they tore up the Act of 1929. The average figure of maternal mortality had remained steady for a period of years over the whole country. Some years it fluctuated up and sometimes down. There were two committees dealing with the question. One was the Departmental Committee on Medical Research, which had already received confidential reports on individual cases. That committee was on the point of making a report. The second committee was dealing with the training and assistance of midwives, and had already reported. That subject raised a very large number of questions of great difficulty, which would involve further legislation. The difficulty was to obtain proper maternity services for antenatal clinics and advisory clinics, and more coöperation on this subject was wanted between national health insurance work and the work of the local authorities. The matter was receiving the attention of the Ministry, but the question of legislation had not been fully explored up to the present by the Ministry of Health. There was no form of health work where the results in proportion to the expenditure were more gratifying than that of advice to expectant mothers. The work of public education in this matter was very important. The percentage of expectant mothers who attended antenatal clinics in Woolwich, where there was a really thorough, good, healthy propaganda, was 40 per cent. The percentage in Bermondsey was 35; in Bristol, 27; Manchester, 13; and Gateshead, 15. The problem was not insoluble. It raised very intricate questions which Parliament would do well to consider. If the local authorities would use their powers to the full and conduct a great campaign of public education to bring up the level of the backward authorities to that of the best, they would see, not a complete solution, but a very gratifying improvement in this service.

Mr. MELLER urged Miss Lawrence to consider the development of the maternity and child welfare clinics, and not to

ask for too much support and coöperation under the National Health Insurance scheme. He said that too much stress was laid on this point, and there was a greater desire to get hold of some of the money for the pockets of the doctors than to provide the health-giving services which should be the main object.

Major GLYN said that he did not want to say anything against the medical profession. It was known what wonderful work was done by doctors, but he often felt that, since the panel system came into force, there had been an inclination on the part of some doctors rather to lie back and not keep to the front of their profession. There was the feeling: "I am a panel doctor, and these people have to come to me. Here am I. I am going to give them so much medicine and get so much for it." One of the most important things with regard to educating the community was to give that public sense of the decencies of life which a man must show towards his wife. There was no doubt that many cases of maternal mortality and infant death were due to the selfishness of the husband. It was not a matter for the medical profession but for public opinion. If possible, perambulating clinics should go on motor lorries to isolated villages and be available to explain to married women the main principles of the ordinary rules of life which people in cities could obtain by going to clinics.

The Tragedy of Maternal Mortality.

Dr. VERNON DAVIES said that he regretted that the debate seemed to have developed into a more or less underhand attack on the medical profession. For an effective maternity and child welfare service they must have doctors. The maternity service of a medical man was an extremely onerous service. He had attended hundreds of confinements for ten days and stayed up all night for a guinea. He would not like to start again. They would find that practitioners were not now inclined to give their time to this work, and there was a tendency for the maternity service to get into the hands of particular doctors and certified midwives. That was a move which had the hearty sympathy of all medical men, because there was no doctor who had anything of a practice who could afford to spend hours on end waiting for some poor woman to be delivered of a child. It was better that certified midwives should attend to cases which lasted so long; they could send for a doctor if necessity arose. Unless the medical man and the midwife were adequately remunerated there would not be an effective maternity service. The question of maternal mortality was one of the greatest tragedies in the life of the nation to-day. Yet the peculiar thing was that it was not of necessity that they got these puerperal cases in the slums. Puerperal fever did not depend on slums, although they naturally did not want women to give birth to children in the slums. There was a tremendous shortage of beds for maternity cases in the country. According to the last report of the Ministry of Health there were 2480. It seemed appalling that there should only be that number for nearly 670,000 births. A method which could be much extended by the Ministry of Health through the local authorities was that they could take over, not what he called municipal maternity homes which were coming into existence, but large houses which had become more or less derelict. If these were made available for maternity homes they would prove a great boon. The need for antenatal work had now become very well recognised, but here again the whole success depended first of all on the doctor, and, secondly, on the nurse. Education and propaganda were needed so that the women of the country, especially the young married women, should realise that it was to their advantage and to that of their baby that they should be examined as early as possible in pregnancy, so that if things were not in order precautions could be taken. There was a Committee sitting to inquire into the training of midwives. He believed that the Ministry of Health had some idea of either doing away with or relaxing some of the regulations of the Central Midwives Board. That would be a retrograde step. The Central Midwives Board had done extraordinarily good work and were doing that work to-day. It should be the duty of the Ministry, instead of handicapping that institution, or interfering with it, to do all they could to encourage the Board in their work. It was also necessary to see that there was efficient after-care and that there were competent health nurses. He was glad that the Ministry of Health insisted that health visitors should possess the health certificate, but there was one great danger which applied to health visitors as well as to other nurses. It did not necessarily mean that a person with the best certificate or with the largest number of degrees was the best person for the work. There were such things as professional tact, common sense, and motherliness.

The Need for Pure Milk.

Another point on which the Ministry might exercise a certain amount of control was the feeding of children. This country was perhaps not so far advanced as it should be in the matter of pure milk. Every effort should be made to see that women suckled their own children, because mothers' milk was best for the child. The Ministry might concentrate more than they did on the question of pure milk. They should pay more attention to the unsweetened condensed milk which was imported from the Continent in such huge quantities, and which the late Minister of Health said was not fit for babies. People bought this milk because it was cheaper than ordinary milk, and in many districts children were being fed on milk which was bound to do them harm. This condensed milk from abroad should not be allowed to be sold, retail, in less than 7 lb. tins. That would immediately stop the sale of the 4 oz. tins, and people would be compelled to provide one of the dried milk foods, or, better still, pure milk from the cow. Our milk-supply required looking into. The amount of adulteration which went on was a disgrace to our civilisation, and very often they found in the residential towns the worst milk-supply. Surgical tuberculosis in children, one of the most dreadful of diseases, was undoubtedly due to tuberculous cow's milk, yet how often was the milk examined for tuberculin? There was tuberculin-tested milk, it was true, but ordinary people could not afford to pay for it. The first duty of the Ministry of Health was to see that the children were fed with tuberculin-tested milk to give them a chance of a good start in life.

Birth Control.

Another subject in connexion with maternity and child welfare centres was the very vexed subject of birth control There was an agitation spreading to certain parts of the country, and among members of the Socialist party it was becoming more and more a political question, that the Government should give doctors at antenatal centres power to inform inquiring mothers as to methods of birth control. The competent medical opinion of the country was definitely opposed to birth control. (Mr. Thurtle: "Rubbish.") Only a few weeks ago a meeting of a medical society was held in London to discuss this very point, and the opinion was overwhelmingly against birth control. Therefore, when people said that they were in favour of birth control they were speaking from ignorance.

Mr. THURTLE asked if Dr. Davies thought that Lord Dawson of Penn was not a very good medical authority, and was he aware that Lord Dawson was strongly in favour of birth control?

Dr. DAVIES said that in the first place Lord Dawson was not an obstetrician. He was a physician generally, and he (Dr. Davies) probably had attended very many more confinements, even as a general practitioner, than Lord Dawson had ever done. Because Lord Dawson happened to be a swell physician it did not mean that he was really a competent authority in deciding that question. When he (Dr. Davies) was speaking of competent medical opinion he was speaking only of the gynæcologists and obstetric surgeons whose work was concerned with maternity and the diseases of women. They were competent to judge because they saw the ill-effects of birth control. Lord Dawson would probably never see the ill-effects of a case like that, which was outside his line of practice. Any obstetric surgeon or medical man or woman accustomed to a large gynæcological practice almost without exception would say that birth control was detrimental to the woman and to the child. He hoped that the Government would persist in the attitude which they had adopted up to now and would refuse to instruct any of their medical officers at the centres to give information on birth control.

An Underpaid Service.

Miss RATHBONE said that she hoped that the Ministry of Health would very quickly put part, at any rate, of the report on midwifery training into practice. The midwifery service was extremely ill-paid. Many of them doubted the wisdom of the recommendation in the report that would place the whole onus of training, and of preparing the syllabus for the training of midwifery, on medical officers of health rather than on the Central Midwives Board. There was always the fear that the medical officers of health had too little practical experience in this kind of work and were too much under the thumb of local medical opinion.

The motion was agreed to.

THE BUDGET.

Mr. SNOWDEN (Chancellor of the Exchequer) made the annual Budget statement in the House of Commons on Monday, April 14th.

He said that he proposed an increase of 6*d.* per £ in the standard rate of income-tax. The existing graduation would be revised to protect small incomes. Instead of giving relief of 2*s.* 3*d.* on the first £225 of taxable income, the relief would be 2*s.* 6*d.* on the first £250. This would mean that in the case of an unmarried or widowed person

with an income, all from investment, not exceeding £485, or with an income, all earned, not exceeding £582, there would be no increase in the income-tax bill. The same was true in the case of a married man with three children unless his income from investment exceeded £735, or, if earned, it exceeded £882. Income-tax payers talked as if they paid 4s. in the £ on all their incomes, but out of 2,250,000 income-tax payers there were not 50,000 who paid the full standard rate of 4s. No person with an income below £3000 paid the full rate, and the great majority did not pay more than from a few pence to 2s. in the £. As regarded life insurance, the old rates of 2s., 3s., and 4s. would remain unchanged. The extra 6d. on the income-tax standing alone would produce about £29,000,000 in a full year. Allowing for the cost of change in graduation (£5,000,000 in a full year), the yield would be about £24,000,000 in a full year and £21,000,000 in the current year. As regarded the surtax, he proposed to correct an anomaly by placing it on the basis that the rate of tax payable in any year would fall to be determined by the financial needs of that year. The increase in the standard rate of income-tax would, of course, be borne by surtax payers as well as other income-tax payers. But the financial needs of the current year were such that he felt bound to call upon the surtax payers to supplement the additional payment of income-tax by an additional surtax. He proposed an increase in the initial rate from 9d. to 1s. in the £, and in the case of incomes over £50,000 an increase from 6s. to 7s. 6d. This would yield £12,500,000 in a full year and £7,500,000 in the current year. The capital now coming under charge to estate duty had now passed £500,000,000, and the yield of estate duty had reached £70,000,000. For estates exceeding £2,000,000 he proposed to increase the rate from 40 per cent. to 50 per cent. Amendments would be made to the existing scale from £120,000 upwards by increases of 1 to 2 per cent. from £120,000 to £250,000, with a growing increase from £250,000 onwards to reach a rate of 50 per cent. on estates exceeding £2,000,000. He expected that the yield would be about £7,000,000 in a full year and about £3,000,000 in the current year. The total effect of the changes in income-tax, surtax, and estate duty would be a yield of £31,500,000 in the current year and £43,500,000 in a full year.

Land Values—Safeguarding Duties.

As a first step to the levying of a contribution upon land values he was taking steps to prepare a valuation of all sites in the country. A separate Bill would be introduced to provide for this valuation. The £10 duty on betting certificates would be repealed as from the end of October. This would cost about £200,000 in a full year and about £180,000 this year. Four safeguarding duties under the existing law were due to expire this year—namely, lace (June 30th), cutlery, gloves, and gas mantles (Dec. 21st). The duties would be continued till these respective dates but would not be renewed. The cost was estimated at £521,000 this year and £823,000 in a full year. The Finance Bill would contain minor relief from stamp duties as they affected certain schemes of rationalisation and amalgamation. The cost would be £250,000. Small alterations proposed last year affecting motor-cycles, commercial motor vehicles between 2 and 2½ tons, and petrol electric vehicles, would take effect on July 1st in the first two cases, and on Jan. 1st in the last case. The cost would be £20,000 a year to the Exchequer and £90,000 a year to the Road Fund. The beer duty would be raised as from April 15th by 3s. per standard barrel, leaving rebate unaltered. This amounted to an increase of 1d. per gallon which was too small to justify an increase of price and the brewers had given assurances that there would be no drop in gravities. The yield would be £3,100,000 in a full year and £2,750,000 in the current year. Legislation would be proposed (*a*) to prevent (1) avoidance of estate duty on landed estates and investments through the medium of private companies; (2) avoidance of surtax by single premium insurance policies; and (*b*) to give revenue authorities rather wider powers of obtaining information in regard to ownership of income. Provisions would be made for a new assessment of all property in Great Britain for income-tax Schedule A. This would come into force for next year 1931–32, and would include the metropolis. From 1931–32 the reassessment would take place automatically at quinquennial periods. Minor provisions would be made to deal with points of hardship, or to make slight readjustments in the inland revenue duties.

National Finance.

Reviewing the national finance for the past year, Mr. Snowden said that there was an actual deficit of £14,523,000, instead of an estimated surplus of £4,096,000. Expenditure exceeded the original estimate by £6,748,000. The total national expenditure for 1930–31 (excluding self-balancing items) was estimated at £781,909,000. If provision was made for the deficit of 1929, and for a small adjustment in respect of Northern Ireland's share of the increased taxation, the total was £787,209,000. The estimated revenue was £739,645,000. The lapse of the safeguarding duties was allowed for in the estimate of £250,000,000 for customs and excise. Other minor changes involved a loss of £450,000. The increase in the beer duty, increase of direct taxation, and the Suspensory Fund would bring the total revenue up to £789,445,000, leaving a surplus for contingencies of £2,236,000.

HOUSE OF COMMONS.

WEDNESDAY, APRIL 9TH.

Tannic Acid Treatment for Burns.

Dr. VERNON DAVIES asked the Home Secretary if the senior medical inspector of factories had reported to him on the tannic acid treatment for burns; and, if so, what decision had been arrived at with regard to its use in factories and workshops.—Mr. SHORT (Under Secretary to the Home Office) replied: Yes, Sir. My right hon. friend has received a report from the senior medical inspector. His conclusion, reached after careful inquiry, is that this form of treatment is not suitable generally for the first-aid treatment of burns at a factory or workshop. It can only be properly given in works where there is an ambulance room properly equipped and in charge of a properly qualified person, and in the treatment of minor burns it has no advantage over sterilised burn dressings. In the case of severe burns it may be valuable where the patient cannot be moved to hospital without considerable delay, but otherwise the protection of the burn by a simple dressing is the proper procedure. He does not therefore advise any modification of the existing instructions.

Dr. DAVIES: Will the hon. gentleman inform the Home Secretary that there is a very large body of medical opinion which totally disagrees with the advice that has been tendered to him?

Mental Patients and Suicide.

Mr. KINLEY asked the Minister of Health the number of cases of suicide and attempted suicide, respectively, which occurred in each of the past ten years in institutions under the jurisdiction of the Board of Control.—Mr. GREENWOOD replied: The Board of Control have no information in regard to cases of attempted suicide. In mental deficiency institutions suicidal acts are extremely rare. The annual reports of the Board of Control state each year the number of patients who have died in institutions for the insane as a result of suicidal acts committed either while in residence or on leave or before admission. The figures for the last ten years are as follow: 1920, 47; 1921, 45; 1922, 52; 1923, 39; 1924, 44; 1925, 47; 1926, 55; 1927, 69; 1928, 64; 1929, 61.

Staffs of Mental Hospitals.

Mr. KINLEY asked the Minister of Health the total of persons employed on staff duty during each of the past ten years in the institutions under the jurisdiction of the Board of Control.—Mr. GREENWOOD replied: The only figures available relate to the charge and ordinary nurses employed in county and borough mental hospitals. The numbers on Dec. 31st in each of the last ten years were as follow: 1920, 14,880; 1921, 15,439; 1922, 15,563; 1923, 15,824; 1924, 16,060; 1925, 16,460; 1926, 16,855; 1927, 17,262; 1928, 17,662; 1929, 17,748.

THURSDAY, APRIL 10TH.

Various Industries (Silicosis) Order.

Mr. HOLLINS asked the Home Secretary when he intended to introduce legislation to amend the Various Industries (Silicosis) Order; and whether he would include, within the amending Order, provision for compensation for partial incapacity due to silicosis.—Mr. CLYNES replied: Amendment of the Various Industries (Silicosis) Order to include cases of partial incapacity is dependent on the passage of the Bill which the Government have introduced to amend the provisions of the Act which relate to medical arrangements for examination and diagnosis. The Bill has already been read a second time in the other House, and it is my intention, as soon as it has passed, to take up the question of the amendment of the Order.

Birching in Borstal Institutions.

Mr. BENSON asked the Home Secretary who was the final authority to sanction birching in Borstal institutions.—Mr. CLYNES replied: Cases are very rare, only one since 1928; and when I replied to my hon. friend's supplementary question on March 31st I was under the impression that such an order would not require my confirmation.

Importation of Chemically-treated Flour.

Viscount ELMLEY asked the Minister of Health if he would briefly indicate the nature of the regulations relating

to the importation of chemically-treated flour?—Mr. GREENWOOD replied: The only regulations are those contained in the Bread Acts of 1822 and 1836, the general effect of which is that no flour may contain any ingredient not being the genuine produce of corn or grain.

Tuberculin-tested Herds and Agricultural Shows.

Brig.-General CLIFTON BROWN asked the Minister of Health whether he had considered the representations made to him by the Royal Agricultural Society and other similar societies as to the order prohibiting tuberculin-tested herds from exhibiting at their shows; and whether he could make it possible for these societies to comply with his requirements by segregating the tuberculin-tested cattle at their shows.—Mr. GREENWOOD replied: I received a deputation from the Royal Agricultural Society and two other societies, and they informed me that they are unable at present to make the requisite arrangements for segregation. The prohibition must, therefore, stand so far as the shows of these societies are concerned, but I am prepared to consider its withdrawal in the case of any shows where satisfactory arrangements can be made.

Sale of Vitacream.

Mr. HANBURY asked the Minister of Health whether his attention had been drawn to the extensive sale of vita-cream, which was seriously competing with the sale of genuine British cream; and whether he would consider the advisability of amending the law so that it should be sold under the designation of cream substitute with the analysis shown clearly on the parcels exposed for sale.—Mr. GREENWOOD replied: My attention has been drawn to the sale of this article, but I regret that I cannot undertake to introduce legislation on the subject at the present time.

New Town-planning Legislation.

Lieut.-Colonel FREMANTLE asked the Minister of Health if he still considered a further measure of town-planning essential to proper housing development; and whether he proposed to introduce legislation for the purposes.—Mr. GREENWOOD replied: It is still my intention to introduce amending town-planning legislation as soon as opportunity permits.

British Spectacle Frames and Ophthalmic Benefit.

Sir GEORGE PENNY asked the Minister of Health whether, in issuing fresh regulations regarding the administration of national health insurance through the approved societies, he would stipulate that spectacle frames dispensed under the scheme should be of British origin.—Mr. GREENWOOD replied: I will consider what steps I can take to encourage the use of spectacle frames of British origin in connexion with ophthalmic benefit under the National Health Insurance Scheme.

Welfare of the Blind.

Mr. TOM SMITH asked the Minister of Health if he was aware of the suggestion of the advisory committee on the welfare of the blind that the reduction of the age limit from 50 to 40 years for the receipt of a blind pension would be fully justified; and whether he proposed, in the near future, to take any action on the matter.—Mr. GREENWOOD replied: The answer to the first part of the question is in the affirmative. With regard to the second part, this matter is under consideration in connexion with others affecting the welfare of the blind, but I am not in a position to make a statement on the subject at present.

Death-rate from Tuberculosis.

Mr. KINLEY asked the Minister of Health whether there were any local authorities whose tuberculosis figures showed little or no decline during the past ten years; and whether he proposed to take any action in the matter.—Mr. GREENWOOD replied: There are a few areas in England and Wales in which there has been little or no decline in the death-rate from tuberculosis during the past ten years. The factors which may bear upon this matter are receiving special study in my department.

Health Insurance Benefit.

Sir KINGSLEY WOOD asked the Minister of Health whether he would make a statement as to the results of the recent investigation by the Government actuary into the claims experience of a representative group of insured persons; and what action he was taking as a result of such report.

Mr. D. G. SOMERVILLE asked the Minister of Health whether his attention had been called to the statement by the controller of the Insurance Department of the Ministry of Health to the effect that the growth of sickness claims was out of all proportion to the increase in the burden of unemployment, and that a complete explanation would have to be sought elsewhere; whether such explanation was being sought; and on what lines.

Mr. D. G. SOMERVILLE asked the Minister of Health if his attention had been called to the warning of his controller against malingering on the part of persons drawing benefits under the National Health Insurance Scheme; and whether he was satisfied that the standard of administration by every society concerned was sufficiently high to ensure that additional benefits were not sacrificed by laxity.—Mr. GREENWOOD replied: I am aware of the position with regard to the increase in expenditure on sickness and disablement benefits, which has been a matter of concern to me for some time past. The report of the Government actuary on the subject will be laid on the table of the House within the next few days. The causes of the increase are under investigation by the departments concerned, and steps are being taken to deal with any laxity which is brought to light.

Sir K. WOOD: Having regard to the grave anxiety among the approved societies, can the right hon. gentleman take any steps, for instance, in connexion with medical certification under the Act? Is there any possibility of improving that?

Mr. RHYS DAVIES: Will the right hon. gentleman ask his staff to find out whether there is not a definite decline in the claims for the first quarter of this year compared with any previous period?

Mr. GREENWOOD: I cannot carry the figures in my head. I have only seen the results of the actuarial investigation in the last six days and I have not had time to examine them.

Mr. BUCHANAN: Before the right hon. gentleman takes any action will he consult the House, because the insured persons have rights equally with the approved societies?

Mr. GREENWOOD: The approved societies represent the members.

Slum Area in Tunbridge Wells.

Dr. PHILLIPS asked the Minister of Health whether any scheme had been placed before him by the municipal council of Tunbridge Wells for dealing with the slum area known as Albion-square, which consisted of 15 houses with two outside taps as their sole water supply, and had a group of water-closets in the centre of the square a few yards from the front entrances of the houses.—Mr. GREENWOOD: The answer is in the negative.

Insulin for Insured Persons.

Dr. MORRIS-JONES asked the Minister of Health the total cost of insulin supplied to insured persons for the year ending Dec. 31st, 1929; and the price per unit paid.—Mr. GREENWOOD replied: The total cost for the year was approximately £40,000. The price per 100 units was approximately 2*s.* 2*d.* during the first five, and 1*s.* 8*d.* during the last seven, months of the year.

Slum Clearance in Greenwich.

Mr. PALMER asked the Minister of Health if he could state the slum-clearance areas of Greenwich selected by the local authority.—Mr. GREENWOOD replied: So far as I am aware five areas have been made the subject of representations by the medical officer of health of this borough. These are known as the Eastney-street, East-street, Charlton, Dean-street, Thames-street, and Watergate-street areas.

Nursery Schools.

DUCHESS OF ATHOLL asked the President of the Board of Education how many nursery schools local education authorities had asked him to approve as a result of the circular sent out by him some months ago jointly with the Minister of Health.—Sir CHARLES TREVELYAN replied: There are at present 37 proposals for new nursery schools before the Board, but I cannot say how many of these are the direct result of the circular.

Fumes from Electric Power Stations.

Mr. LOVAT-FRASER asked the Minister of Transport if he had received any complaints of offensive fumes emitted from electricity generating stations in the neighbourhood of Regent's Park; and, if so, what action he proposed to take.—Mr. HERBERT MORRISON replied: Complaints with regard to the emission of fumes from the generating stations in the neighbourhood of Regent's Park have been brought to my notice, and the Electricity Commissioners have been in communication with the undertakers on the subject. The London Power Company are conducting a series of tests on a full scale plant which is now in operation in connexion with one of their chimneys. The Marylebone Council have appointed a committee of experts to advise them in the matter. I do not think any further action on my part is called for at the present time.

Vaccination and Small-pox.

Mr. FREEMAN asked the Minister of Health the number of children compulsorily vaccinated in 1929, the number for whom exemption was claimed, the number of deaths of children from small-pox, and the number of deaths of children

associated with vaccination.—Mr. GREENWOOD replied: The following is the information asked for: During the year 1929, 297,627 certificates of successful primary vaccination of children under 14 years of age, and 267,044 statutory declarations of conscientious objection, were received by vaccination officers in England and Wales. During the same period, among children under 14 years of age, 12 deaths occurred which were classified to small-pox, and 16 deaths in which the words "vaccination," "vaccinia," or "post-vaccinal encephalitis" appeared in the medical or coroner's certificate. Eleven other cases of children under 14 years of age were brought to the notice of my department in which death occurred within four weeks of vaccination. In at least eight of these cases there is no reason to think that vaccination contributed in any way to the fatal issue.

MONDAY, APRIL 14TH.

Indian Medical Degrees.

Mr. FREEMAN asked the Secretary of State for India whether he was yet in a position to make any further statement on the action of the General Medical Council in withdrawing recognition of various medical degrees of India.—Mr. WEDGWOOD BENN replied: I am unable to add anything to the reply which I gave to the hon. Member on March 20th.

Mr. FREEMAN: Is the right hon. gentleman aware of the widespread indignation aroused in this matter, and can nothing be done to expedite consideration of the question?

Mr. BENN: I am sure the Government of India are fully aware of the great importance of this matter, and I am sure that they are dealing with it as expeditiously as they possibly can.

Mr. FREEMAN: Is it in the power of India to withdraw similar recognition to British medical degrees in India?

Mr. BENN: I should like notice of that question.

Major GRAHAM POLE asked the Secretary of State for India whether the Government of India had come to any decision in regard to a provisional arrangement for guaranteeing Indian medical degrees pending the introduction of legislation in the Indian legislative assembly to establish an all-India medical council.—Mr. WEDGWOOD BENN replied: The Government of India made proposals having the object indicated in the question, but these proved unacceptable to the General Medical Council. They have made no further proposals since the decision of the General Medical Council to discontinue recognition was announced.

Pension Cases and the Seven-year Limit.

Mr. RAMSBOTHAM asked the Minister of Pensions how many pension cases outside the seven years' limit had been brought to his notice since the official statement on Government policy with regard to that limit; how many had been allowed; how many were old cases; how many of these latter had been refused in spite of furnishing fresh medical evidence; and in how many cases the private doctors concerned disagreed with the findings of the Ministry's medical board.—Mr. J. A. PARKINSON, who replied on behalf of the Minister of Pensions, said: During this period, I am informed, some 9500 fresh applications have been received and about 2500 applications have been revived. Altogether 227 claims have been recognised by the Ministry during the same period, either by way of pension or treatment, though naturally it has not yet been possible to investigate more than a proportion of the recent applications. I understand that the records of the Ministry do not enable the information asked for in the last two parts of the question to be given, but that in the majority of cases no fresh material medical evidence has ordinarily been produced in support of revived claims.

Traffic in Opium and Dangerous Drugs.

Mr. MANDER asked the Home Secretary whether the French Government had now published the decree providing for direct limitation of the manufacture of narcotic drugs referred to in the report on the work of the advisory committee on traffic in opium and other dangerous drugs of the League of Nations, held at Geneva in January and February this year.—Mr. CLYNES replied: The decree was gazetted in the *Journal Official* of March 25th.

LIVERPOOL HOSPITALS.—The suggestion has been made at Liverpool that the voluntary hospitals of the city should combine to establish one large institution for all classes to obviate the necessity of building separate extensions and reduce overhead costs. Point is added to the proposal by the position of the Southern Hospital, which has a debt exceeding £40,000. Notwithstanding a grant of £13,000 from the Merseyside Hospitals Council there was last year a deficit of £2278, and a large capital outlay for extensions and equipment is immediately necessary.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At recent examinations the following candidates were successful:—

D.P.H. AND D.T.M. AND H.

Part I.—R. J. Dyson, M. S. El-Kinani, C. O. Karunakaran, *J. H. Loots, Flora H. G. Macdonald, Ethel Morris, K. C. K. E. Raja, and Joan Robinson.

* Distinguished.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—At an ordinary meeting of the College on April 14th Sir John Rose Bradford, F.R.S., was re-elected President. The following diplomas were conferred, jointly with the Royal College of Surgeons:—

D.T.M. and H.—G. H. Arndt, Shaikh Attaullah, Balkrishna, C. L. Bhola, R. C. Burgess, A. D. Cust, W. C. Davidson, Eugene Egan, A. P. Farmer, P. V. Gharpure, F. W. Gilbert, C. J. Hackett, W. R. Little, A. F. Mackay, N. M. Maclennan, W. A. Mirza, Zvi Miterstein, S. K. Mitra, C. C. Okell, G. M. C. Powell, J. T. Sorley, J. H. Strahan, W. K. Stratman-Thomas, S. H. Swift, G. E. Tilsley, E. A. Trim, L. E. Vine, N. T. Whitehead, K. L. Wig, and Francis Williams.

D.O.M.S.—S. S. Ahluwalia, Mohammad Ata Ullah, J. H. Beaumont, Athanas Blagoff, Erramilli Dikshitulu, R. R. Ghosh, W. H. Gordon, A. H. Jackson, N. M. Macindoe, A. O. Maher, I. C. Michaelson, C. C. Mukhopadhyay, Frank Phillips, Harnam Singh, A. D. Williamson, and F. C. Wilson.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a meeting of the Council on April 11th, with Lord Moynihan, the President, in the chair, diplomas of Membership were granted to A. H. Baker (Manchester), W. W. Gerrard (Liverpool), C. C. Kapila (Rangoon and Charing Cross), and J. I. Rerrie (St. Bart.'s).

Mr. Ernest E. Ware and Prof. Frederic Wood Jones, being Members of 20 years' standing, were elected to the Fellowship.

Diplomas in Tropical Medicine and Hygiene were granted jointly with the Royal College of Physicians to 30 candidates.

The Jacksonian prize for 1929 was awarded to Mr. D. H. Patey, of Middlesex Hospital, for his essay on the Pathology, Diagnosis and Surgical Treatment of Diseases of the Salivary Glands. A certificate of honourable mention for an essay on the same subject was awarded to Mr. Reginald T. Payne, of St. Bartholomew's Hospital. For the year 1930 the subject for the Jacksonian prize is the Pathology of Ovarian Cysts and its Bearing on their Treatment, and for the year 1931 the Surgery of the Sympathetic Nervous System.

The John Tomes prize for 1927–29 was awarded to Mr. Evelyn Sprawson for his work on the chemical and microscopical structure of enamel and investigations in connexion with dental pathology. Miss L. E. Tracey, of the London School of Medicine for Women, was appointed Begley Student for the ensuing three years on the result of the recent examination in anatomy under the Conjoint Examining Board. Prof. G. E. Gask was appointed Thomas Vicary Lecturer.

It was reported that Dr. Harvey Cushing, of Boston, U.S.A., the Lister Medallist for 1930, would deliver the Lister Memorial Lecture at the College on Wednesday, July 9th.

Sir Arthur Keith, F.R.S., will deliver six Hunterian lectures on the Anatomy of Fossil Man, illustrated by recent discoveries, at 5 P.M. on Mondays, Wednesdays, and Fridays, from May 5th to 16th, at the College in Lincoln's Inn-fields.

CANCER RESEARCH FELLOWSHIP.—Under the will of the late Miss Ann Pilkington, of Accrington, £8000 of the residuary estate will be handed over to the University of Manchester for the establishment of a fellowship in cancer research.

UNIVERSITY OF BIRMINGHAM.—The Ingleby Lecture will be given on Thursday, May 22nd, at 4 P.M., by Sir John Bland-Sutton, and will be entitled the Blood Trail.—Prof. W. E. Dixon, F.R.S., will give seven Withering memorial lectures on Specific Therapy, on Wednesdays from May 7th to June 18th, at 4 P.M.—At 4 P.M. on Thursday, May 15th, Dr. C. W. Buckley will speak on Mineral Waters in Therapeutics—their Scope and Practical Application.—All these lectures will be delivered at the building in Edmund-street.

A course of post-graduate demonstrations will be given at the General Hospital, Birmingham, on Tuesdays from 3.30 to 5 P.M., and at the Queen's Hospital, Birmingham, on Fridays, 3.30 to 5 P.M., beginning on April 29th at the General Hospital and on May 2nd at the Queen's Hospital. Further particulars may be had from the clerk to the Clinical Board, the University, Edmund-street, Birmingham.

UNIVERSITY OF LONDON.—The following courses have been arranged: Three lectures on the Chemical Activities of Micro-organisms, by Dr. A. J. Kluyver, professor of microbiology in the Technische Hoogeschool, Delft, at the London School of Hygiene and Tropical Medicine, at 5.30 P.M. on Tuesday, Thursday, and Friday, May 13th, 15th, and 16th; two lectures on Some Biological Aspects of the Human Skin, by Dr. H. Leslie-Roberts, consulting physician to the Skin Department of the Liverpool Royal Infirmary, at St. Thomas's Hospital Medical School, at 5.30 P.M. on Thursday and Friday, May 1st and 2nd; three lectures on Treatment of Uterine Cancer by Radiations, by Dr. A. Lacassagne, of the Pasteur Laboratory at the Institute of Radium, Paris, at the London (R.F.H.) School of Medicine for Women, at 5.30 P.M. on Monday, Tuesday, and Thursday, May 12th, 13th, and 15th; six lectures on the Early History of Generation and Comparative Anatomy, by Mr. F. J. Cole, F.R.S., professor of zoology in the University of Reading, at University College, at 5.30 P.M. on Wednesdays and Thursdays, from May 7th to 22nd; and three lectures on Pharmacological Reactions of Involuntary Muscle, by Dr. J. A. Gunn, professor of pharmacology in the University of Oxford, at King's College, at 5 P.M., on Wednesday, Thursday, and Friday, May 7th, 8th, and 9th.

Application is invited for the Laura de Saliceto studentship, of the value of £150 a year, for the advancement of cancer research. The studentship is a part-time appointment, and particulars may be had from the Academic Registrar.

University College.—The annual dinner of the Fellows will be held at the College at 7.15 for 7.30 P.M. on Wednesday, April 30th. Sir John Rose Bradford, F.R.S., will preside.

Brevet-Colonel Sir John Marnoch, K.C.V.O., has been appointed a Deputy Lieutenant by the Lord Lieutenant of the County of Aberdeen.

ESSEX TUBERCULOSIS SANATORIUM.—On Saturday, April 26th, at 3.15 P.M., Mr. Arthur Greenwood, the Minister of Health, will open the new sanatorium at Black Notley.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—The annual provincial meeting of the Fever Hospitals Group of this Society will be held at the City Hospital, Little Bromwich, Birmingham, at 3 P.M. on Friday, April 25th. Prof. K. Wilkinson, cardiologist to the hospital, will read a paper and give a demonstration on the electrocardiograph in the study of the heart in diphtheria.

BAYLISS-STARLING MEMORIAL SCHOLARSHIP.—This scholarship, of the annual value of about £120, with exemption from tuition fees, is tenable at University College, London. The scholar will be required to follow a course of training in physiology and biochemistry. Application should be made to the secretary of University College before May 14th.

TUBERCULOSIS IN BELGIUM.—The Belgian Cabinet have decided to set aside 100,000,000 francs (£571,400) for the crusade against tuberculosis. The National Anti-tuberculosis League will undertake the work and 2500 additional beds will be provided for the treatment of patients. The gift is intended to mark the centenary of Belgian independence.

LONDON HOSPITAL MEDICAL COLLEGE.—Two open Entrance Scholarships, each of the value of £100, have been awarded as follows: Mr. H. J. Barrie, Exeter College, Oxford; Mr. H. B. Tipler, Christ's College, Cambridge.

JEWISH HEALTH ORGANISATION OF GREAT BRITAIN. A symposium on Physical and Mental Aspects of the Jew will be held at the Conway Hall, Red Lion-square, Holborn, W.C. 1, at 3.15 P.M., on Sunday, May 25th, with Sir Humphry Rolleston in the chair. Prof. M. Ginsberg, Dr. L. Isserlis, Mr. W. M. Feldman, and Dr. E. Miller will read papers, and a discussion will follow.

BRITISH ORTHOPÆDIC ASSOCIATION IN DUBLIN.—The first meeting of the British Orthopædic Association to be held in Dublin took place on April 11th and 12th, under the presidency of Mr. R. C. Elmslie. Some 30 members were present. The meetings were held in the hall of the Royal College of Physicians, with clinical meetings at the Orthopædic Hospital, Mercer's Hospital, and Cappagh Open-air Hospital, where demonstrations were given respectively by Mr. W. S. Haughton, Sir William Wheeler, and Mr. H. F. MacAuley. On the evening of April 11th the Association dined at the Shelbourne Hotel, and entertained a large number of guests. On Sunday, April 13th, those members who had been able to remain so long in Ireland had a motor drive through much of the most beautiful scenery in County Wicklow, and were entertained to lunch by the Earl of Wicklow at Shelton Abbey, near Arklow.

Dr. G. E. Spero, who was returned to Parliament at the last election as Member for Fulham, is retiring from the House of Commons because ill-health has prevented his regular attendance.

BROMPTON HOSPITAL FOR CONSUMPTION.—The annual report states that more than 2400 new patients were admitted last year, and that there were nearly 40,000 out-patient attendances. Work has been greatly facilitated by the extensive reconstruction schemes which were completed last year. The new X ray department is capable of dealing with 10,000 cases annually. Patients' payments exceeded £6000.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
FRIDAY, April 25th.—5 P.M., MEDICINE. Cinematographic Demonstration: Dr. L. G. Rowntree (Mayo Clinic): Ganglionectomy in Chronic Arthritis. Paper: Prof. Dixon and Dr. G. N. Myers: The Curative Action of Digitalis in Toxæmia. 8 P.M., EPIDEMIOLOGY. Paper: Prof. S. Lyle Cummins: Some of the Clinical and Pathological Factors Underlying Mortality Rates in Tuberculosis.

MEDICO-LEGAL SOCIETY.
THURSDAY, April 24th.—8.30 P.M. (at 11, Chandos-street, Cavendish-square, W.), Dr. A. Knyvett Gordon: The Importance of the Gonococcus in Medico-Legal Investigations. To be followed by a discussion.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ST. MARY'S HOSPITAL INSTITUTE OF PATHOLOGY, W. 2.
THURSDAY, April 24th.—5 P.M., Sir Almroth Wright: Twelve Years' Work on Immunisation of the Blood in vitro.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.
TUESDAY, April 22nd.—5 P.M., Mr. H. Burt-White: The Importance and Treatment of Hæmorrhage in Pregnancy.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.
WEDNESDAY, April 23rd.—5 P.M. (at St. John's Hospital, 49, Leicester-square, W.C.), Dr. R. Hallam: The Relationship of Erythema Pernio to Acrocyanosis.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, April 23rd.—4.15 P.M. (at the Royal Samaritan Hospital for Women), Dr. John Gardner: Gynæcological Cases.

Appointments.

ABBOTT, EDITH, I. L., M.B., B.S. Lond., has been appointed Asst. Medical Officer of Health, Hornsey.

GRAHAM, J. R., M.B., Ch.B. St. And., D.P.H., Medical Officer of Health, Brighouse.

HIGSON, W. D., M.B., Ch.B. Liverp., D.P.H., Medical Officer of Liverpool Prison.

Hull Royal Infirmary: GILL, J. F., M.B., Ch.B. Vict., F.R.C.S. Eng., Honorary Surgeon. YOUNG, J. N., M.B., Ch.B. Edin., F.R.C.S. Edin., Assistant Honorary Surgeon.

Certifying Surgeons under the Factory and Workshop Acts: BOWEN, G. J., M.B., B.S. Lond., D.P.H. (Haverfordwest); and MACLACHLAN, D. C., M.B., Ch.B. Glasg. (Denny, Stirling).

Medical Referees under the Workmen's Compensation Act: MITCHELL, A. P., M.D., F.R.C.S. Edin. (Midlothian County); MARSHALL, H. F., F.R.C.S. Edin., L.R.C.P. Lond. (Congleton and Sandbach, and Macclesfield); and PINKER, H. G., M.R.C.S., L.R.C.P. Lond. (Totnes and Kingsbridge, and Plymouth).

Vacancies.

For further information refer to the advertisement columns.

Aden Settlement, Arabia.—M.O.H. Rs.800 per mensem.
Bath, Royal United Hospital.—H.S., Asst. H.S. At rate of £150 and £100 respectively. Also H.P. £120.
Bedford County Hospital.—H.S. At rate of £175.
Birmingham General Hospital.—Asst. Clin. Path. £300.
Blackburn Royal Infirmary.—3rd and 4th Res. H.S.'s. £175 and £150 respectively.
Bournemouth County Borough.—Asst. M.O., &c. £650.
Bradford Royal Infirmary.—H.P. and H.S. Each £150.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.
Bristol City and County.—Asst. M.O.H. £600.
Bristol Eye Hospital.—Jun. H.S.
British Medical Association.—Asst. Med. Secy. £1000.
Burnley, Victoria Hospital.—H.P. At rate of £150.
Cambridge, Addenbrooke's Hospital.—H.P. and H.S. Each at rate of £130.

Carshalton, Queen Mary's Hospital for Children.—Jun. Asst. M.O. £500.
Central London, Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Res. H.S. At rate of £75.
Charing Cross Hospital, W.C.—Physician for Mental Disorders,
Connaught Hospital, Orford-road, E.—Sen. Res. H.S. At rate of £150. Jun. Res. H.S. At rate of £100.
Cornwall County Council.—Locum Tenens, Tuberculosis Officer. £50
Durham County Hospital.—Jun. H.S. At rate of £120.
Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £150.
Exeter, Royal Devon and Exeter Hospital.—H.S. to Spec. Depts. At rate of £150.
Gloucestershire Royal Infirmary.—2nd H.S. At rate of £100.
Great Yarmouth General Hospital.—Jun. H.S. £125.
Halifax Royal Infirmary.—First H.S. Also Third H.S. At rate of £175 and £100 respectively.
Hastings, Royal East Sussex Hospital.—Jun. Res. M.O. At rate of £100.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O., also H.P. At rate of £150 and £100 respectively.
Hospital for Sick Children, Gt. Ormond-street, W.C.—Res. M.O. for Country Branch Hospital, Tadworth. At rate of £250.
Hospital of St. John and St. Elizabeth, 60, Grove End-road.—Res. H.P. At rate of £100.
Huddersfield County Borough.—M.O.H., &c. £1100.
Hull Royal Infirmary.—H.S. to Spec. Depts. At rate of £150.
Infants Hospital, Vincent-square, Westminster.—H.P. At rate of £75.
Inverness, Northern Infirmary.—H.P. £100.
Lancaster Royal Infirmary.—Part-time Radiologist.
Leamington Spa, Warneford General Hospital.—Hon. Ophth. Surgeon.
Leicester Royal Infirmary.—Hon. Surgeon.
Manchester Royal Infirmary.—Asst. M.O. for Massage and Electrical Dept. £100.
Middlesex Hospital and Medical School, W.—Med. Registrarship. At rate of £300.
Montrose Royal Asylum.—Asst. M.O. £325.
Newcastle-on-Tyne.—Hon. Surg. to Gynæcological Dept.
Prince of Wales's General Hospital, Tottenham, N.—Hon. Asst. P. Also Hon. Surg. Reg. £100.
Queen's Hospital for Children, Hackney-road, E.—H.S. At rate of £100. H.P. At rate of £100. Also Cas. O. At rate of £100.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.S. At rate of £100.
St. Thomas's Hospital,—Asst. M.O. in Physico-therapeutic Dept. £250. Also Sen. M.O. in Venereal Dept. £675.
Salford Royal Hospital.—H.P., also Cas. H.S. Each at rate of £125.
Sheffield Royal Hospital.—Res. Ophth. H.S., also Res. Anæsthetist. Each at rate of £80.
Sheffield Royal Infirmary.—Asst. Cas. O. At rate of £80.
Southampton, Royal South Hants and Southampton Hospital.—Cas. O. At rate of £160.
Stafford County Mental Hospital.—2nd Asst. M.O. £600.
University College Hospital Medical School, W.C.—Chair of Bacteriology. £1200.
Wakefield, Clayton Hospital.—Two H.S.'s. Each at rate of £150.
Wigan, Royal Albert Edward Infirmary and Dispensary.—Surgeon in charge of Orthopædic Dept.
Wolverhampton Royal Hospital.—Hon. Asst. Surgeon.
Worcestershire County Council.—Asst. County M.O. £600.
York, Bootham Park.—Jun. Asst. M.O. £300.

Births, Marriages, and Deaths.

BIRTHS.

CHURCHER.—On April 8th, at Grange-gardens, Eastbourne, the wife of D. G. Churcher, M.D., F.R.C.S., of a daughter.
EDWARDS.—On April 4th, at St. John's Hill, Shrewsbury, the wife of Frank H. Edwards, F.R.C.S.E., of a son.
HUGHES.—On April 10th, at The Mall, East Sheen, S.W., the wife of Royston Hughes, L.D.S.R.C.S. Eng., of a daughter.

MARRIAGES.

DUTHIE—ALLEN.—On April 10th, at St. Peter's Church, Hale, Ogilvie Maxwell Duthie, M.D., to Mary Barbara, youngest daughter of Mr. and Mrs. E. Wagstaffe Allen, of Hale, Chester, and Glossop, Derbyshire.
HARDWICK—JAMES.—On April 2nd, at St. Mewan Church, Cornwall, A. G. P. Hardwick, M.R.C.S., L.R.C.P., *M.C.*, of Island House, Newquay, Cornwall, to Suzanne Clemens James, younger daughter of Mr. and Mrs. R. James, Nakajanka, Newquay, Cornwall.

DEATHS.

CAZALY.—On April 16th, at Earl Soham, Suffolk, Lieut.-Colonel W. H. Cazaly (I.M.S. retired), in his 57th year.
GEORGE.—On April 12th, after a brief illness, W. Stanley George, M.D., of Finchley-road, Hampstead, N.W.
GOVAN.—On April 7th, suddenly, of pneumonia, Robert Govan, M.D., D.P.H.
HUTTON.—On April 7th, Malcolm Hutton, M.A., B.Sc., M.B., Ch.B., D.P.H., late of Shaw, Oldham, and Barrowden, Stamford, aged 49.
SMELT.—On April 7th, at the Royal Sussex County Hospital, Brighton, Charles Allen Casterton Smelt, M.B., C.M. Edin., of Cambridge-road, Hove, aged 66.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

CORPULENCE.*

ITS CAUSES AND CURE.

By WILLIAM F. CHRISTIE, M.D. EDIN.

Prof. Stanley Eddington has shown that man is precisely half way in size between the atom and the star; obviously he allows a considerable latitude for personal expansion on either side. If, therefore, some folk are plumper than others I am not prepared to be too dogmatic about them. Yet I believe that each of us has his own ideal figure, the weight at which he feels healthiest, fittest, and happiest. Most men of 25 years of age and women of 20 are physically at their best, and no great increase of weight after these ages seems necessary or advisable. A deviation above 15 per cent. is abnormal, and there adiposity begins.

It is customary to divide cases into two main groups: 1. Those which are caused by exogenous factors: the simple or lesser adiposities. 2. Those which owe their origin to endogenous defects: the complex or greater adiposities. There is probably an intermediate group which includes a number of ill-defined borderland cases whose fatness appears to arise from both exogenous and endogenous causes. In the future, perhaps, this group will be expanded, for we are beginning to suspect that both processes operate in every case to a varying degree.

EXOGENOUS CORPULENCE.

This is by far the larger group. Here fat accumulates on an otherwise healthy person because the intake of energy in the form of food has exceeded the output of heat and work. Physiological equilibrium has been upset.

Nature has arranged that "appetite" shall dictate the amount of fuel which is required for a man's daily activity, but she also provides an internal contrivance for neutralising minor errors of judgment. It is probable that the endocrine glands play an important part in this automatic self-regulating device, but what exactly is its constitution is unknown. It cannot deal with any major errors of judgment, or even minor ones if these are long continued, but its power and strength varies to some extent with race, family, and individual. When physiological equilibrium is disturbed beyond the ability of this mechanism to rectify it, then the excess of food is tucked away within the fat depôts of the body. Thus Nature has granted to human beings a very considerable degree of personal control over their adipose tissues, and that is very necessary.

Racial adiposity.—With those groups of men whose food supply is intermittent, reserves of fat are accumulated on the body during times of plenty to live upon during periods of poverty; some tribes of North America and Central Africa swing annually from the extremes of corpulency to excessive leanness. In the Antarctic a thick layer of adipose tissue is necessary to keep out the cold, and the Eskimo develops it. There are nations that cultivate the fat figure because they like it; for instance, the chances of marriage for the thin Tunisian girl are few. Hindu moneylenders fatten on purpose because a corpulent exterior advertises their riches and their ability to lend. Most European people can become fatter if they want to. Big game hunters tell one that they fatten in the towns before proceeding into the jungle. Uncle Sam, once lean and gaunt, no longer typifies the American citizen who has assumed, as the result of prosperity, more John Bull-like proportions. The reverse process is just as attainable. The corpulent German of pre-war days had disappeared by 1918. I know of no nation that is fat willy-nilly. Perhaps the Jews are cited most frequently as the stoutest race in the world, but then their food is probably the most fat-forming of any.

Familial adiposity.—When we turn from the family of nations to the smaller family of individuals, we note again the inheritance of fat-forming habits. Fat parents develop fat children because they overfeed and under-exercise them as they did themselves. Of course, many families are marked by a common stamp, some being tall, some lean, some better covered, but these are normal conditions whereas corpulence is abnormal. Dr. Veeder made the interesting observation about a group of fat school-boys that, in every instance, one or both parents were over weight. He studied the home conditions and formed the personal impression that an inherited tendency to corpulency existed. It may be that, if a surfeit of food is indulged by successive generations, the offspring will ultimately inheri

* Being the opening paper at a discussion on Corpulence held by the Harveian Society of London.

weak endocrine glands. Nevertheless, no one has proved it. In my last series of 75 cases of adiposity, 28 per cent. were members of families which ran to fat and frankly blamed their pedigree. They showed no evidence, however, of a sluggish metabolism and the majority reduced themselves to normal proportions by dieting.

Corpulence appears to be an acquired disease, and chiefly the knowledge of how to acquire it is likely to be propagated from parent to child.

Individual Adiposity.

It is instructive to consider first the occurrence of corpulence amongst those who have no voluntary powers of self-indulgence. The infant-in-arms must needs accept the fare which is provided; he cannot counteract excesses of food by voluntary increase of physical activity.

1. *Infantile Adiposity.*

Breast-fed babies.—Occasionally Nature makes a blunder in regard to the quantity as well as the quality of the mother's milk, and unduly fat babies result. Some women have enough milk to feed two childern. It is a common fault for mothers to present both breasts to the infant at each meal, or one breast to him whenever he cries, and the child obtains more milk per day than he actually requires. Sudden over-feeding results in vomiting and diarrhœa; it is the long-continued slight excesses which produce in time the fat child—every day a little more than the infant needs. Too much fat in a mother's milk, although uncommon, accounts for a few plump infants.

Bottle-fed babies.—This type used to be commoner than it is to-day and arose from an excessive allowance of starch and sugar in certain proprietary foods or to adding too much lactose to cow's milk. Children, fattened on the breast or bottle, become slender after their introduction to a mixed diet, but not all escape from the after-consequences. A well-balanced diet of moderate quantity and correct proportions is necessary if the infantile automaton is to preserve the natural proportions. Comparatively slight errors of diet are soon productive of adiposity. The stout hypothyroid child must be distinguished, of course, from the dietetically fat infant. The former belongs to the endogenous group of obesities.

2. *Juvenile Adiposity.*

The growing child, like other animals of tender age, the calf, the lamb, or the puppy, is rarely fat. On the contrary, leanness is typical of the intervening years from infancy to maturity. The maintenance diet of the average school-boy should exceed that of the average adult on account of the claims of growth—3500 calories per day compared with 2500. Growth insists on an abundance of exercise to stimulate the development of bone and muscle, and children who do not jump do not grow.

Nevertheless, corpulence does sometimes occur and is most frequent around the age of puberty. Roughly, 3 per cent. of boys become stouter at that time and a slightly larger percentage of girls. About half of them belong to the endogenous group who show signs of a pituitary or thyropituitary defect, but the others are corpulent without obvious cause. Possibly these have stopped growing temporarily or reduced the rate, as frequently happens. We know that they lose their excess of fat as they grow up, without having altered their daily habits and without any treatment.

Some observers are not satisfied with this explanation. Since the onset of the malady coincides with the development of the sexual functions, they are inclined to blame a temporary disturbance of the glands of internal secretion, although there may be no signs of it. They would place the corpulence of puberty in the "intermediate group" of fat people who owe their over-fatness to the dual cause. Thus, consider the case of girls. The advent of ovarian secretion might be supposed to cause an under-activity of the thyroid and posterior part of the pituitary glands, and possibly an alteration in pancreatic activity. As the glands settle down once more and the board of endocrine control works again in harmony, the obesity disappears. The theory seems probable enough, but we must not forget that the tomboy develops at this time an unusual sedentarism, the same alimentation is continued, while the increased warmth of home life is more sought after than the old rough and tumble of open-air exercise. Girls at puberty are awakening to the maternal instinct which centres around hearth and home.

3. *Adult Adiposity.*

When the adult stage is reached, growth ceases and with t that perpetual motion which characterises the growing child; food should be reduced in consequence, but three additional factors must be considered—namely, occupation, emperament, and possibly climate.

Occupation.—The civilised life to-day is a very unnatural one. The whole method of earning one's living has changed of recent years. This is an age of intensive industry, but it is mechanised up to a point. The fireman of the modern ship feeds his furnace by turning on the tap of an oil spray, whereas his predecessor had to feed his boilers by shovelling in the coal. Labour in many factories is merely the controlling of an automatic instrument. Lifts exist in hotels, houses, and offices to save muscular exertion. Brains have replaced brawn, but intellectual activity does not burn calories. Millions of workers earn their bread by scribbling from an office stool, taking physical exercise more or less desultorily during the week-ends only. Occupation must be granted a large say in the production of corpulence.

Temperament.—The phlegmatic restful person spares muscular movements while those who constantly make small ones expend a great deal of energy in the course of the day. The economy of physical effort practised by the stout is apparent to all.

Climatic conditions.—In the English summer most people lose weight; in the winter they gain it. Perhaps this is due to Nature accommodating the body to external conditions, but more likely the warmth and quiet of indoor life during the colder months helps increase of flesh, while the exuberance of outdoor exercise in the warm ones tends to loss of it. In the tropics most Britishers become thinner.

The quantity of the fuel foodstuffs which an adult requires fluctuates from day to day in accordance with his activity and the coldness of the weather. No person can say that another overeats unless he knows the amount of physical work which that one has to perform. The physician in medical practice needs about 2200 calories of fuel per day while the athlete requires 4000; half of the meat of the one would be surplus to the other's requirements. You will see, therefore, how deep must be the inquiry into the habits of the corpulent before the cause can be determined. Now the exogenous adiposities of to-day are seldom the result of "open" self-indulgence. We eat less, probably, than did our forefathers, although there may still be a few people who think of Heaven as a place with a canteen in it. The gourmand enjoys that sense of repletion which comes from a distended stomach. The majority of our stout patients are gourmets in that they indulge the flavour of certain fat-forming foods. Some are carbohydrate eaters from preference (potatoes, bread, cakes, whisky). Others are attracted to fats only (butter, animal fats, cream, cheeses, oils), while the tooth of a third may be "sweet." This would not matter if they kept the total calorie value of the day's rations reasonably close to their calorie expenditure. But they do not,

When Men and Women get Fat.

Men.—There are two periods in men's lives when they tend to corpulence. 1. After giving up the athletic life to enter business, perhaps to marry and start a home of their own. 2. After attaining worldly prosperity, when they begin to ease off. These are times when activity wanes and appetites should decrease. Remember that Nature is counting calories even though men may have forgotten to do so. This is particularly true in regard to the use of alcohol. Not every man realises that a whisky and soda contains considerable fat-forming potentialities; a small whisky has the energy equivalent of one egg. Few men would care to scoff four eggs after a good dinner, but quite a number will drink four whiskies. Alcoholic drinks, according to the number consumed, ought to be regarded as part of a meal and should not be additional to it. For this reason quite a number of cases of obesity are alcoholic in origin.

Women.—There are three occasions in particular when women become stout: 1. Immediately after growth has stopped. Youthful maidens suffer from adiposity four times more frequently than young men of similar age. Various explanations have been offered. One has regard to the anabolic proclivities of the female and the katabolic tendencies of the male. 2. After child-bearing. About 40 per cent. of obese females date their corpulency to motherhood. Starved of social and athletic pursuits on account of carrying and nursing the baby, young mothers are encouraged to eat to excess of specially selected, highly nutritive foods, to drink Burgundy and other wines to which they were never accustomed, in order—so it is imagined—to maintain their strength and the better to suckle their infants. Most mothers reduce their figures later on by dieting, but some do not try. Successive pregnancies add to the embonpoint. Physicians should guard against over-feeding their patients whether they be convalescent from surgical operation, sickness, or maternity. 3. At the menopause. The physiological decline of the ovaries or their surgical removal would seem to justify the placing of menopausal adiposity in the intermediate group. But all castrates do not fatten. One finds, however, that some of these cases have a basal metabolic rate on the low side, suggesting a thyroid insufficiency, although few fall so low as minus 15 per cent. It seems to me that a woman who

has preserved her figure until the age of 50 has an obvious right to attribute her newly acquired fatness to her loss of ovarian secretion. Nevertheless, many women become less active at this time, sit about more, very often eat more, and sometimes develop capricious appetites. In consequence they suffer from an upset of physiological equilibrium at the very time when their endocrine system of glands is disorganised and incapable of maintaining an even balance.

ENDOGENOUS OBESITY.

A small but intensely interesting group constituting not more than 10 per cent. of all cases. Here we have to look for the cause of the obesity beyond the mere intake of food and the expenditure of physical energy to a defect in metabolism. The disturbance is pathological rather than physiological, and originates as a rule in the glands of internal secretion, one of whose functions it is to regulate the metabolic processes (i.e., defective metabolism through faulty glandular regulation). These victims of obesity have been likened to Strasbourg geese who have fatness thrust upon them. An inexplicable gain in weight is often the first sign of endocrine defect, and may be due to a deficiency of thyroid secretion, of posterior lobe pituitary secretion, of the gonadal, and probably of the pancreatic.

The endogenous obesity of infants is hypothyroidic in origin and develops before the age of two. The endogenous type of juvenile obesity is hypopituitary or hypo-thyro-pituitary in origin and manifests itself somewhere between the fifth and fifteenth year. The corresponding type of adult obesity may be either of these, but is more often pluriglandular. Gonadal obesity is said to occur only after the age of 30, but probably it occurs before this age.

Since the thyroid gland, which is the chief regulator of metabolism is disturbed by any serious or long-continued dysfunction on the part of any one of the other glands, it must be doubtful if different types of endogenous obesity can be truthfully described. Yet some differentiation is interesting from the clinical point of view. It is said that thyroid insufficiency leads to a general deposition of fat—face, neck, breasts, abdomen, with hand and supraclavicular padding. Pituitary obesity is situated about the shoulder and pelvic girdles, with often an apron of fat hanging down from the lower abdomen. Gonadal is a trochanteric adiposity, with mammary and mons enlargement. In pluriglandular obesity the types are fused. I am not a great believer in diagnosing the gland affected from the location of the fat deposited.

Associated with these obesities are the classical syndromes of endocrine defect. A lowering of the basal metabolic rate below 15 per cent. is generally taken as a sign of thyroid insufficiency, and an abnormal sugar curve suggests a posterior lobe pituitary defect, but is not confined to it. We have still to find a reliable test for gonadal weakness.

The cause of these endocrine obesities may or may not be discoverable. Take, for instance, the pituitary gland. There may be a defect in development—a primary hypoplasia. The gland may be injured as by a fracture of the skull, involved in inflammations such as tuberculosis, or poisoned by the toxins of infective disease. It is sometimes the seat of new growths or is pressed upon by tumours originating in the neighbourhood. Other glands have their own particular pathology.

THE CURE.

The modern treatment of adiposity varies with the cause. When this is removed, of course, the fattening process will cease. In the exogenous group faulty habits of living and feeding will need correction. Familial as well as individual traits of temperament and custom may have to be altered, but the ultimate result should be a 100 per cent. cure. In the endogenous group the glandular defect must be repaired. Because this is difficult, results are not so good. Attempts to reawaken dormant glands to renewed activity by the application of electrical stimuli or heat have not been crowned by much success, and substitution therapy is generally resorted to. The hypothyroid case has the best prognosis, since thyroid extract acts as a specific. When more comes to be known of the unexplored realms of endocrinology, better results may be anticipated.

In both types of obesity it will be necessary to rid the body of its surplus fat, and there is no other way to my knowledge than burning it in the flames of metabolic activity. Whatever method of dieting is adopted, it should be accompanied by measures designed to keep the body healthy. Turkish, radiant heat, or other variety of sweating bath promotes excretion of water and the end-products of an unusual combustion. Muscular exercise must be graded in accordance with the patient's strength, and should not be so great as to increase appetite. Massage promotes a sense of physical well-being, but actually its fat-reducing benefits are conferred only on the masseur. The amount of sleep in the 24 hours, the weight of clothes worn, and the prevention of constipation are also worthy of attention.

AN ANÆSTHETIC APPARATUS.

A DEMONSTRATION was lately given before the Royal Scottish Society of Arts by Mr. William Fulde, of the Heriot-Watt College, Edinburgh, of an apparatus which enables anæsthetics of different character to be administered under conditions making for complete safety in control. By means of a compact device it is possible to supply to a patient at will ether (intertracheal or by vapour mask), nitrous oxide and oxygen, or ethylene (or other gaseous anæsthetic) with carbon dioxide. A single control enables the percentage of ether to be regulated within wide limits and permits of any required mixture of chloroform and ether. The volume of supply can be varied from 5 to 40 litres per minute, the quantity passing at any moment being indicated by a simple flow-gauge. A hot-water chamber in the base of the apparatus warms the air current both before and after mixture and can be supplemented by a low-power morganite electric heating element. Air current may be supplied by a motor-blower, foot bellows, or compressed air cylinder. The supply is uniform and there is no risk of liquid anæsthetic being carried across. The whole can be carried in an average-sized attaché case.

A CENTURY-OLD JIBE AT THE STETHOSCOPE.

THE current issue of the *Observer* contains the following excerpt from its own columns a hundred years ago :—

By means of an instrument called the stethoscope, applied to the breast bone, some modern medical writers profess to discover what is going on within. This new art is called auscultation, and the internal sounds pectoriloquism. By means of this new discovery a learned physician professes to have heard "metallic tinkling" at the heart or in the lungs of a patient. A bystander, however, thinks the "metallic tinkling" was only audible from two pieces of coin which found their way into the palm of the doctor.

The date is April, 1830, 12 years after the appearance of Laennec's classical work and a year after a third edition of its translation had been published in London. Evidently the stethoscope did not come into general use as quickly as some have supposed.

CREMATION SOCIETY OF ENGLAND.

OF late years disposal of the dead by cremation has become much more widely practised; the Cremation Society of England has attempted to bring the importance of this movement before the public, and a steady advance has resulted. Crematoria have been opened at Edinburgh and Guernsey during the past year; others are in the course of erection at Brighton and Nottingham, and the provision of crematoria is being considered by a large number of municipal bodies. The aims of the society are based on a doubt of the adequacy of present systems of burial. Cemeteries in large towns are overcrowded and expensive, while on the score of hygiene there can be no comparison between cremation and interment. The crematoria established by the society, by beautiful surroundings and architecture, have done much to dispel public prejudice based, as it is, almost entirely on the dictates of custom. The numbers are increasing of those who choose to have their ashes dispersed in some open, possibly consecrated space, and it would be hard to imagine a more gracious end than that of the golfer whose ashes were recently scattered near a tee on the links which had always obstructed his play. The society makes use of propaganda in the form of simply worded posters for display during Health Week and similar exhibitions; leaflets are also distributed to members of some of the approved societies and of the national insurance scheme, many of whom are erroneously of the opinion that cremation is beyond their means. The work of the society should meet with success, for the horror of corruption still haunts mankind, even after centuries of burial. With what disgust the Romans must have regarded the Christian custom of interment of their dead; the prevailing dread of cremation is less well founded. "To be gnawed in our graves, to have our skulls made drinking bowls, and our bones turned into pipes, to delight and spoil our enemies, are tragical abominations escaped in burning burials. Urnal interments and burnt relicks lie not in fear of worms, or to be an heritage for serpents."

FIRST-AID BY RAILWAYMEN.—The Canadian National Railways, with the coöperation of the St. John Ambulance Association, provides a corps of experts to teach first-aid to their 100,000 employees. The work has just been extended by placing in service a car fitted as a miniature railway hospital, which is shortly to be followed by two others. It contains full emergency equipment and a lecture theatre for demonstrations, and will be used principally in the more remote parts of the Dominion where there is a scarcity of instructors with few opportunities for studying first-aid.

Goulstonian Lectures

ENTITLED

THE SIGNIFICANCE TO CLINICAL MEDICINE OF STUDIES IN CALCIUM AND PHOSPHORUS METABOLISM.

The First Goulstonian Lecture in 1930, delivered before the Royal College of Physicians of London on March 11th

BY DONALD HUNTER, M.D. LOND.,

FELLOW OF THE COLLEGE; ASSISTANT PHYSICIAN TO THE LONDON HOSPITAL.

MR. PRESIDENT, FELLOWS, AND GENTLEMEN,—Before proceeding to my lecture, I desire to express my sincere gratitude to you, Mr. President, and to the censors of the College for the honour you have conferred upon me in inviting me to give these lectures: the gratification which I feel, however, is tempered by humility when I contemplate the long line of distinguished Fellows who have been my predecessors in this post.

The subject of calcium and phosphorus metabolism is so vast that I shall limit myself to those aspects of it which seem to me to illuminate the field of clinical medicine. If I refer repeatedly to my own observations, or to those of workers with whom I have been closely associated, it is mainly because we have used a systematic method for investigating calcium metabolism which allows of comparison between different patients and diseases.

In this first lecture I shall attempt briefly to review the normal mechanism of calcium and phosphorus metabolism and then to discuss the action of the parathyroid hormone.

NORMAL METABOLISM OF CALCIUM.

Calcium is an element essential to the life of plants and animals. In the form of carbonate and phosphate it constitutes two of the most important soil compounds. The carbonic acid of soil water converts insoluble limestone and calcium phosphate into soluble acid salts. These are in part removed from the soil by the plant, for in the germination of seeds and in the growth of plants calcium exerts a specific action. Different species of plants and different parts of the same plant contain different amounts of the element. Seeds, roots, and tubers are poorly supplied, but the green parts are especially rich, and green food is therefore the greatest source of calcium for herbivorous animals. Man derives calcium principally from milk, cheese, butter, eggs, green vegetables, and nuts.

Absorption of Calcium.

Calcium exists in our food in both organic and inorganic combination. It is probable that digestive changes convert it entirely into the inorganic form, and that it is absorbed as calcium salts partly or completely ionised. Nevertheless calcium salts given by the mouth, whether soluble or insoluble, appear to be absorbed only with difficulty. It is important to remember that an excess of calcium in the diet is desirable, for the very good reason that interaction with carbonates of the digestive juices reconverts some of the ingested calcium into insoluble carbonate, which escapes absorption and is lost in the stools.

The daily calcium requirement of an adult is between 0·4 and 1·0 g., and the latter figure can be regarded as allowing the necessary margin for safety.[1] Until the growth of the skeleton is complete the daily requirement exceeds this figure.

It has been claimed that calcium chloride is absorbed with much greater ease than calcium lactate. There is no doubt that administration of calcium chloride often produces a greater rise in the serum calcium than is the case with calcium lactate, but this is explained by the fact that the ingestion of calcium chloride in large doses produces an acidosis which is itself responsible for part of the rise in the serum calcium.

Excess of certain mineral constituents in the diet may be detrimental to calcium assimilation. The action of potassium and magnesium, in this respect, is little understood, but the influence of a large excess of phosphate is to be expected, since calcium phosphate is so insoluble. A great deal of work has been done on the relationship between calcium absorption and the sugar content of the diet. It would seem that the addition of 25 per cent. of lactose to the diet increases the absorption of calcium.[2]

Studies of the effects on calcium metabolism of the addition of fat to the diet have been pursued for many years. It was found that some fats were efficacious in improving calcium absorption whereas others were not. Attention was therefore turned to the vitamin content of fat as a possible explanation. It was then found[3] that cod-liver oil was equally effective, whether administered fresh or after oxygenation for twelve hours, whereby its content of vitamin A had been entirely destroyed. It was obvious, therefore, that the effects were not due to vitamin A, and since they were apparently not due to the fat itself, it was necessary to postulate an antirachitic vitamin distinct from vitamin A. More recent work on the effects of ultra-violet irradiation has led to the view that certain fats contain a special antirachitic substance, vitamin D. This is more resistant to oxidation than is vitamin A, and can be produced in many otherwise inactive fats, such as olive oil, by exposure to ultra-violet light. It is now known that vitamin D is a derivative of ergosterol, or some closely related sterol,[4] and that as such it can be synthesised in the skin. It seems to be the main factor governing the absorption of calcium, but whether or not it directly affects calcium utilisation in the tissues remains for future metabolism experiments to decide.

Excretion of Calcium.

It is generally accepted that calcium is eliminated by the large intestine and to a less extent by the kidney. The average concentration of calcium in the saliva is 9 mg. per 100 c.cm., in the gastric juice 6 mg., in the pancreatic juice 7 mg., and in gall-bladder bile 11 mg. By the use of Thiry-Vella pouches in dogs it has been shown[5] that calcium is eliminated to a much greater extent by the lower intestinal mucosa than by the upper. Thus daily washings with distilled water of a pouch of the upper jejunum yielded up to 1·2 mg. of calcium, the corresponding figure for the lower ileum being 8·5 mg. and for the colon 15 mg. It follows, then, that on a normal diet the fæcal calcium consists of the unabsorbed surplus together with re-excreted calcium.

The urinary excretion of calcium varies from 0·1 g. per day on a low calcium diet to 0·5 g. on a normal diet. It is perhaps not sufficiently well recognised that acid-forming diets increase the urinary excretion of calcium.[6 7] For example, it has been shown[8] that a diet consisting of bread, meat, rice, fats, macaroni, and sweets, and excluding milk, green vegetables, and fruits may give rise in the body to about 700 c.cm. N/10 excess acid. Such a diet may double the normal elimination of calcium in the urine and may cause a marked increase in the titratable acidity and ammonia output. When such an acid-forming diet is neutralised with an equivalent amount of sodium bicarbonate, there is no longer either an increased titratable acidity, or an increased ammonia and calcium elimination in the urine. This indicates that the increased excretion is caused purely by the excess of acid in the diet.

When acidosis is deliberately brought about by large doses of ammonium chloride, a very great increase of calcium excretion may be produced.[9] For example, in a normal subject on a low calcium

diet taking 12 g. of ammonium chloride a day, Aub[8] found that the urinary calcium was increased in three days from 0·1 to 1·1 g., while the fæcal calcium remained essentially unchanged. The degree of response varied with the individual, but there was always an increased calcium output.

The effects of the parathyroid and thyroid hormones on calcium excretion will be discussed later.

Calcium Content of Blood.

Very wide variations are found in the figures given for the calcium content of whole blood, serum, plasma, and corpuscles. To no small extent this is due to untrustworthy methods. The evidence is almost conclusive that the red cells of the blood contain no calcium: at the most, but minute traces can be present. Most workers state that the calcium content of the plasma is practically identical with that of the serum. There is evidence,[10] however, that in true plasma, obtained by rapid cooling and centrifuging of the blood drawn under paraffin, the concentration of calcium is 10 to 15 per cent. higher than in the corresponding serum.

In estimating the blood-serum calcium, the Kramer-Tisdall method as modified by Clark and Collip[11] gives results with an average error of 2 per cent. and a maximum error of 5 per cent. The normal figure by this method varies between 9·0 and 11·0 mg. per 100 c.cm.

Now in the cerebro-spinal fluid the figure is only 5 to 6 mg. per 100 c.cm., and in agreement with this difference it has been found that serum and plasma calcium is but little more than half diffusible. It is obvious, therefore, that calcium is present in blood plasma in more than one form. Actually it is believed to be present in three forms:—

1. Un-ionised, non-diffusible organic compounds	about 4·5 mg. per 100 c.cm.
2. Un-ionised, diffusible, or dialysable inorganic compounds..	about 3·5 mg. per 100 c.cm.
3. Calcium ions, diffusible	about 2·0 mg. per 100 c.cm.

Electrometric determinations are responsible for the last figure, and the methods for the determination of the diffusible calcium are very unsatisfactory.

The methods of dialysing the serum against distilled water or a solution of known calcium concentration are slow and inaccurate. In collodion filtration the results may be affected by the time of filtration and by the pressure employed. For these reasons we have been content in our investigations to estimate only the total serum calcium.

Certain physiological variations in the serum calcium are of interest. Thus it has been found to be higher during the first few days of life and during the suckling period than in adult life. The claim that the serum calcium rises before menstruation and then rapidly falls is based on the faulty methods of twenty years ago, and modern work fails to confirm the observation. The best attested alteration in the serum calcium occurs during pregnancy and is doubtless due to the drain on the maternal tissues to meet the growing demands of the fœtus. Bogert and Plass[12] found that the average calcium content of the serum was 9·1 mg. per 100 c.cm. for 23 women at the time of labour, and 10·2 mg. for 12 normal non-pregnant women.

It has been shown that the blood calcium of certain birds increases very considerably at the period of ovulation. Thus in female pigeons[13] a rise in blood calcium begins 123 hours before the beginning of the formation of an egg-shell. Subsequently, during a period of from three to five days these birds withstand without trace of adverse effect a hypercalcæmia up to 20 mg. per 100 c.cm. Similarly the female cod[14] in the spawning season has a blood calcium varying from 12·7 to 29 mg. per 100 c.cm., whereas the corresponding figure in the male lies between 9 and 12·5 mg. This calcium is probably required for the elaboration of the eggs, which are especially rich in that element.

Calcium in Tissues.

Speaking approximately, for there are no reliable figures, calcium is distributed evenly throughout the soft tissues in amounts comparable to those found in the blood plasma. Thus muscle contains 6·5 mg. per 100 g. When, however, we come to the skeleton the corresponding figure is about 10,000 mg. Calcium phosphate constitutes 80 per cent. of the mineral content of bone. There are in addition calcium carbonate, which makes for greater hardness, magnesium phosphate, and traces of fluoride, the last being present in greatest amount in the enamel of teeth. The protective shells of invertebrates consist almost entirely of calcium carbonate, but traces of phosphate are invariably present, and there is good ground for belief that the presence of phosphate is absolutely essential both for shell and for bone formation.

The calcium in milk is about equally divided between organic and inorganic constituents, the organic compound, calcium caseinogenate, being non-diffusible. The inorganic calcium is chiefly calcium hydrogen phosphate, with some bicarbonate and citrate. The activity of the mammary gland is responsible for a concentration of calcium which averages 42 mg. per 100 c.cm. in human milk and 120 mg. in cow's milk.

Functions of Calcium.

The most obvious function of calcium in the body is, of course, the formation of bone. It has perhaps been insufficiently emphasised that the skeleton of the mammal is not only a supporting structure, but is also a reservoir of calcium and phosphorus. Even after full growth is complete, bone salts are being continuously removed and renewed, and they are not once and for all laid down and fixed. And since bone is the only considerable reservoir of calcium in the mammal, the skeleton can be drawn upon not only for the skeletal needs of the fœtus where there is a dietary deficiency of calcium, but, apparently often as a normal procedure, as in the production of milk. The hen, on a diet deficient in calcium, can draw on its skeleton for the calcium of the egg-shell. Further the skeleton is not the only structure which acts as a reservoir for calcium. There is experimental evidence that the shell of the egg can be dissolved by the carbonic acid produced by the growing embryo to yield a soluble calcium salt for the needs of the embryo: 80 per cent. or more of its calcium requirements are provided from the shell.[15]

Apart from the growth and maintenance of the skeleton, calcium plays an important part in the blood and tissues by maintaining along with other ions a balanced system which determines the degree of irritability of muscle and nerve. In this way calcium ions help to control the heart beat, the contractility of plain and striped muscle, and the transference of impulses at the neuro-muscular junctions and through synapses. In general it may be stated that calcium ions play an important part in lessening the irritability of the tissues containing them.

Nevertheless wide variations from the normal can exist without apparent interference with such functions. Thus in post-operative tetany and infantile tetany the serum calcium may drop to 6 mg. per 100 c.cm. before any symptoms or signs of lack of calcium are observed. Conversely, in parathyroid over-dosage and in spontaneous hyper-parathyroidism we have observed symptomless hypercalcæmia, the serum calcium values being 19·8 and 16·7 mg. per 100 c.cm. respectively.

An important function of calcium is to aid in the coagulation of shed blood. Mellanby[16] showed that the action of calcium is specific, since, although salts of magnesium, strontium, and barium will, in the presence of thrombokinase, convert prothrombin into thrombin, none of them compares in potency with calcium. It follows that any manipulation which depletes the blood of calcium ions, such as the addition of oxalate or citrate, prevents clotting. The delayed coagulation time in hæmophilia may be due

theoretically, to a variation of any one of the factors concerned in clotting, but there is no evidence worth the name to indicate a calcium defect.

Cases of fatal hæmorrhage after operations for obstructive jaundice may perhaps be explained by removal of calcium ions which have combined with bile salts. Little or no satisfactory work is to be found on this subject.

In the clotting of milk, calcium ions are essential in the process of converting casein into insoluble calcium caseinate, the clot mesh.

Normal Metabolism of Phosphorus.

Phosphorus is ingested in the food as nucleoprotein (meat), phosphoprotein (milk), lecithin (egg yolk, liver), and as inorganic phosphate. It is found in the blood, not only in the inorganic state, but also in combination with a variety of organic radicles. The organic compounds are acid-soluble "ester phosphorus," and alcohol-ether soluble "lipin phosphorus." It is, perhaps, not sufficiently realised that less than one-twelfth of the total phosphorus is present as inorganic phosphate.

Plasma Inorganic Phosphorus.

The plasma and corpuscles contain equal amounts of inorganic phosphorus, so that the results of analyses may be expressed as milligrammes of phosphorus per 100 c.cm. of whole blood or plasma. Most of the early work on blood phosphate must be accepted with caution, for it was not known before 1914 that the distribution of phosphorus changes when blood is allowed to stand. Once the corpuscles have been laked, the liberated organic esters are very rapidly hydrolysed by the plasma phosphatase, and the concentration of inorganic phosphate rises rapidly. However, with adequate precautions, using the method of Briggs,[17] the experimental error should not exceed 2 per cent.

In health the level of inorganic phosphate in the blood varies between 2·5 and 3·5 mg. phosphorus per 100 c.cm. In children, where ossification is more active, readings up to 5 mg. per 100 c.cm. are found. The blood obtained from the umbilical cord at birth may contain as much as 6 mg. per 100 c.cm.

The metabolism of phosphorus is closely interwoven with that of calcium, and many of the observed fluctuations in the blood phosphate can be accounted for as secondary to changes in calcium. There is often a reciprocal relationship between calcium and inorganic phosphorus in the blood, though this is only approximate and does not apply where absorption of phosphorus is defective.

Functions of Phosphorus.

Phosphorus compounds take part in at least four important metabolic processes. They are in some way essential to the storage or utilisation of carbohydrate, they enter into the chemical changes which precede the contraction of muscle, they are concerned with acid-base equilibrium, and they are essential to the deposition of bone.

The physico-chemical mechanism of ossification is little understood. Freudenberg and György[18] have suggested that the cartilage protein forms a compound with calcium by virtue of its acidic groups, that the resulting compound, having now a preponderance of basic groups, combines with phosphate ions, and that the calcium-protein-phosphate complex so formed breaks down with deposition of insoluble calcium phosphate and liberation of the original protein. Holt, La Mer, and Chown,[19] from their work on the physical chemistry of calcium phosphate solutions, conclude that the blood serum is to be regarded as a supersaturated solution of tertiary calcium phosphate, and that the plasma bathing the bone matrix, where solid calcium phosphate is present, readily gives up its surplus and so enables the bone to grow.

The interesting theory of Robison[20] as to the possible significance of bone phosphatase in the process of ossification has been supported by much experimental evidence. The work of Kay[21] on plasma phosphatase, in the study of certain metabolic diseases of bone, has provided circumstantial support for Robison's theory from an entirely different quarter.

Phosphatases.

For our knowledge of the distribution and possible functions of phosphatases in the body we are indebted to Robison, Kay, and collaborators. Phosphatases are enzymes which hydrolyse phosphoric esters such as glycerophosphate and hexosephosphate. Many of these esters form soluble calcium salts. Such esters are widely distributed in the tissues, mainly inside the cells. Two such esters occur in mammalian red cells, and a phosphoric ester, hydrolysable by animal phosphatases occurs, in small quantities only, in human plasma. Phosphatases also hydrolyse pyrophosphates which are said to occur in muscle tissue.

Distribution of Phosphatases.

Phosphatases are very widely distributed in mammalian tissues. In the human adult the epithelial portion of the intestinal mucosa is richest in phosphatase, the whole kidney next. There is more in the cortex of the kidney than in the medulla, and more in the mucous membrane of the intestine than in the submucosa. Adult bone contains phosphatase very unequally distributed, the enzyme being present mainly below the periosteum. Per unit weight of bone, young growing bones contain much more phosphatase than adult bones. Again the distribution is very irregular, the enzyme being present mainly in the zone of provisional calcification and in the periosteum. Fœtal bones contain a still higher proportion of phosphatase per unit weight of bone. The concentration of phosphatase in and about the cells of the ossifying zone in fœtal cartilage is probably greater than that of phosphatase in any other tissue. The fœtal kidney, on the other hand, contains considerably less phosphatase than the kidney a few days after birth.

Plasma Phosphatase.

In 1929 Kay published a method[21] for estimating the activity of the phosphatase in the plasma. He expresses this enzyme activity in terms of the number of milligrammes of phosphorus liberated as inorganic phosphate from excess of sodium β-glycerophosphate in 48 hours at 38° C. and at pH 7·6 by 1 c.cm. of plasma. Under these conditions the average value for normal plasma is 0·15 mg. In young infants the figure is higher.

In certain generalised diseases of bone the phosphatase of the plasma frequently rises to 10 or 20 times the normal. Very high figures are constant in osteitis deformans. In generalised osteitis fibrosa (three cases), in secondary carcinomatosis of bones (one case), in rickets and in renal rickets high figures have been found. On the other hand, in focal osteitis fibrosa (eight cases) and in osteogenesis imperfecta the figures are normal.

Bone Phosphatase.

There seems little doubt that phosphatase plays a part in the chain of events by which the deposition of calcium phosphate in growing bones is brought about. Robison's hypothesis[20] may be briefly stated as follows: the osteoblasts and hypertrophic cartilage cells secrete a very active phosphatase, which, by hydrolysing the phosphoric esters of the blood, brings about a local increase in the concentration of phosphate ions. The solubility product of tertiary calcium phosphate is thereby exceeded, and deposition of this salt occurs in the ossifying zone. The enzyme probably plays a part also in the maintenance and repair of bone in the adult.

The evidence in favour of this hypothesis may be briefly outlined as follows:—

1. Phosphatase is present in the growing bone in greatest amount in those areas in which deposition of calcium phosphate is proceeding most rapidly.

2. It can be demonstrated in vitro that a growing bone split longitudinally is still capable of the deposition of calcium phosphate from a solution of a

soluble calcium phosphoric ester salt such as calcium hexosemonophosphate or calcium glycerophosphate, and that deposition occurs mainly in the cells in the zone of provisional calcification.

3. Phosphatase appears in cartilage simultaneously with the appearance of centres of ossification.

4. There is no phosphatase in cartilage which is not ossifying.

5. There is a substrate for the enzyme present in red cells and also in circulating plasma.

6. In certain generalised diseases of bone the plasma phosphatase is high. This establishes another correlation between phosphatase and bone tissue, though its exact significance has still to be discovered.

Phosphatases in Intestinal Mucosa and Kidney.

Phosphatases in the intestinal mucosa hydrolyse the phosphoric esters in the food. All the evidence at present available indicates that phosphoric esters taken by mouth are absorbed as inorganic phosphates. Any phosphoric ester in the food is probably completely hydrolysed by the phosphatases of the intestinal juice and the mucosa before absorption into the blood stream. The rate of hydrolysis of various phosphoric esters is not, however, the same, so that the more resistant will probably be hydrolysed further down the intestine than the less resistant. Milk, for example, in addition to caseinogen, contains calcium phosphate in at least seven other forms of combination. These compounds of milk will be hydrolysed and their components absorbed at different levels in the intestinal tract. The peculiar ease with which the calcium and phosphorus of milk are taken up from the intestine is probably dependent upon these facts.

The kidney phosphatase possibly plays some part in the secretion of inorganic phosphate in the urine.

Methods of the Metabolism Ward.

In the study of calcium metabolism it is necessary to know, not only the levels of calcium and phosphorus in the blood, but also the calcium and phosphorus balance; for just as the level of a river does not indicate the direction in which it flows, so the levels of the figures in the blood give us, in themselves, no indication as to whether calcium is flowing into excretory channels or into the tissues.

In our studies of endogenous calcium metabolism[22 23] we have given a diet containing only 100 mg. of calcium a day but adequate in all other respects. This is necessary in order to reduce to a minimum the amount of unabsorbed calcium in the fæces. Fluid and sodium chloride intake have been kept constant, and distilled water has been used in the preparation of all food and drinks. Sufficient alkali has been given by mouth to make the reaction of the 24-hour mixed urine neutral to phenol-sulphonephthalein (pH 7·3). The fæces have been divided into three-day periods by the oral administration of 0·3 g. of carmine alum lake every third day. The urine has been obtained in 24-hour specimens.

Since inorganic salt excretion reaches a constant level only very slowly, we have endeavoured to change our conditions of study not more than once in twelve days.

Effects of the Parathyroid Hormone.

The parathyroid glands exert a specific effect upon calcium metabolism. The pioneer work of MacCallum and Voegtlin[24] demonstrating a reduction of serum calcium in dogs after parathyroidectomy has been abundantly confirmed. It is well established that this condition is relieved by the administration of calcium salts. The idea that it is due to guanidine intoxication remains unsupported by adequate evidence.

Effects of Parathyroid Extract on the Blood.

The view that calcium deficiency is the direct cause of post-operative tetany is considerably strengthened by the work of Hanson[26] and Collip,[27] who isolated an active extract of the parathyroid gland. Injections of this substance abolish tetany in parathyroidectomised dogs, the serum calcium being restored to normal.

I will illustrate this from some of our unpublished experiments.[25]

Control of Tetany after Total Thyro-parathyroidectomy in a Dog.—A dog weighing 6·5 kg. had been kept for four weeks on a meat diet. Total thyro-parathyroidectomy was performed under ether anæsthesia. Violent tetany, with extensor spasms of the limbs, appeared 16 hours after operation. The dog was found lying on its side very ill, with great muscular weakness and vomiting. There was striking hyperpnœa with a respiratory rate of 135 per minute, and laryngeal stridor with a hoarse bark. The serum calcium was 5 mg. per 100 c.cm. and the inorganic phosphorus 6·5 mg. per 100 c.cm.

An intramuscular injection of 15 units of parathormone* was given, and three hours later the dog was normal. There was no muscular weakness. Normal activity and appetite had returned. The respiratory rate and bark were normal. The serum calcium had been raised. However, unless injections of the hormone were given daily, the serum calcium fell and the dog relapsed into violent tetany.

Administration of Collip's extract to normal dogs raises the serum calcium above normal to an extent so nearly proportional to the dose as to afford a means of standardisation.

During certain observations on patients suffering from chronic lead poisoning[22] we had the opportunity of investigating the effect of parathormone on the chemistry of the blood and on calcium excretion. These patients were kept on a constant diet containing an inadequate amount of calcium. Parathormone was given by intramuscular injection either twice or three times a day. In regulating the dosage we were guided very largely by the level of the blood calcium. In five patients out of six we found that, by giving an average dose of 55 units daily, the blood calcium could be increased to 13 mg. per 100 c.cm. or more within eight or nine days. The most effective method was to give three doses a day and to increase the daily dosage continuously from, say, 20 to 100 units by adding 10 units daily (Fig. 1). This gradual elevation of the calcium level in the blood is the most dramatic effect of parathormone, but its extent varies in different individuals, and we found that it was more marked when calcium lactate was added to the diet.

Effects of Parathyroid Extract on Calcium Excretion.

Our observations on patients suffering from lead poisoning enabled us to contribute to the vexed question of the relation of the parathyroid glands to calcium excretion. Now, before the isolation of potent extracts of the parathyroids, erroneous conclusions had been arrived at as to the effect of thyro-parathyroidectomy on calcium excretion. Thus the statement of MacCallum and Voegtlin[24] that after this operation dogs showed an increased excretion of calcium has not been corroborated. Cooke[28] repeated their work and was unable to find any change in the excretion of calcium after parathyroidectomy. In spite of this contradictory report, the statement of MacCallum and Voegtlin became widely accepted. Thus arose the idea, to which Salvesen[29] later contributed, that parathyroidectomy was associated with a lowered threshold for the excretion of calcium by the intestines. It was supposed that the resulting drain on calcium kept the blood-serum calcium at a low level. Greenwald and Gross[30] have demonstrated that the true conception of the relation of the parathyroid glands to calcium excretion is the very reverse of that above stated. By a technique which eliminated many sources of error incurred in previous animal experiments, they demonstrated that dogs after parathyroidectomy actually showed a decrease in the excretion of calcium. In a later series of experiments[30] they were enabled, by the use of Collip's parathyroid extract, to approach the problem from the opposite point of view. They injected normal dogs with the extract

* Throughout our experiments we have used this preparation of Collip's parathyroid extract generously supplied to us by the courtesy of Eli Lilly and Company, of Indianapolis.

and found that the increased concentration of calcium brought about in the blood-serum was followed by an increase in the excretion of calcium.

During our investigations on patients with chronic lead poisoning we were able to make nine observations on the effects of parathormone on calcium excretion when the intake was known. It will be seen from Fig. 1 that, in such a patient, during control periods on a low calcium diet a negative calcium balance already existed, the average excess of output over intake being 0·37 g. in a three-day period. In all our observations parathormone definitely increased this negative calcium balance, the average increase being 53 per cent. The increase was roughly proportional to the dosage given. Thus, where parathormone was given in increasing doses for 6 days (Fig. 1) the negative calcium balance rose to a maximum of 1·01 g. in a three-day period, a figure very much higher than the average quoted above. When parathormone was discontinued, the calcium output did not immediately drop to normal but remained somewhat raised for periods of from three to six days.

The increase of calcium output was very much more marked in the urine, the increase of fæcal excretion being negligible. Where large doses of parathormone were given, the urinary output of calcium rose to very high figures. Thus in the case referred to above, where parathormone was given in increasing doses for 16 days, the output of calcium in the urine rose from 0·069 g. to 0·754 g. in a three-day period.

The relation between the level of the blood calcium and the calcium excretion is important. Although we found that hypercalcæmia was always associated with an increased calcium output, the converse was not found to be true. In one case large doses of parathormone failed to produce a significant rise in the blood calcium, but, in spite of this, the total calcium excretion was doubled.

In considering the physiological action of the parathyroids, the source of these large amounts of calcium appearing in the urine is of fundamental importance. We consider it justifiable to infer from our results, as Greenwald[30] did from his animal experiments, that parathormone, administered during deficient calcium intake, causes increased excretion of calcium salts from the bones. This will be referred to later in connexion with hyper-parathyroidism and also in dealing with the question of the storage of lead, mercury, and radium in the bones.

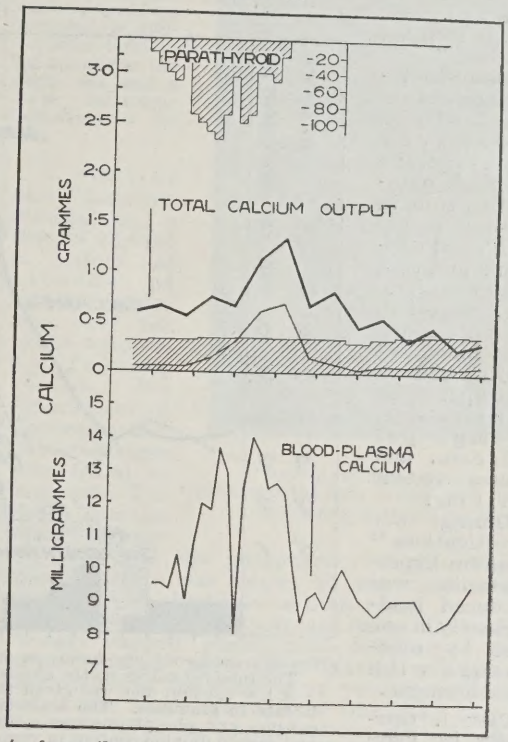
Effects of Parathyroid Extract on Phosphorus Metabolism.

Though the most dramatic effects of parathormone are on the blood calcium and calcium excretion, there is evidence[31 8] that its primary effect is on phosphorus excretion. Parathormone abruptly increases the urinary phosphorus excretion without affecting the fæcal excretion. At the same time the level of the inorganic phosphorus in the blood is reduced. When parathormone injections are stopped, the urinary phosphorus excretion rapidly falls to a level below that found before. These changes are more rapid than those just described in the case of calcium metabolism. They are also greater than can be explained by a theoretical calculation of the phosphorus liberated with calcium and nitrogen from calcium phosphate and protein respectively), so that the excreted phosphorus is evidently derived directly from the body fluids.[32]

These remarks apply only to the primary effect of parathormone on phosphorus metabolism. If parathormone is continued in large doses a secondary effect appears later. It was first emphasised by Collip that when a certain critical level of serum calcium has been reached, following parathormone injections, the blood phosphorus rises abruptly. This may be due to an alteration in kidney function resulting from the high serum calcium, for the non-protein nitrogen of the blood also rises. Thus a further effect of parathormone on phosphorus metabolism is brought about, which is exactly opposite to the primary effect.

There are several other observations which lend support to the view that the primary action of parathormone is on phosphorus. Greenwald[30] has shown that there is a marked retention of phosphorus in the first two days after parathyroidectomy. This suggests the possibility that the bad effect of a meat diet on parathyroid tetany may be due to its high phosphorus content. Collip[33] showed that, following parathyroidectomy in the rabbit, the serum phosphorus rose without much change in the serum calcium, and that parathormone, if administered directly following operation, would prevent this rise. He stated that "these observations tend to emphasise the importance of phosphorus in relation to the pathogenesis of tetany." Further, tetany has been produced in dogs by intravenous injection of phosphates,[34] and likewise by administering large doses of phosphates by mouth.[35]

FIG. 1.



Effect of parathyroid extract on the blood calcium and on the calcium excretion.

The interval marks on the abscissa represent five days.

In the upper portion of the chart the upper block represents treatment with parathyroid, the adjacent scale indicating units per day. The lower blocks represent the calcium intake in three-day periods. The faint line represents the excretion of calcium in the urine expressed in output for three days. The heavy line is the total excretion of calcium for urine and fæces for three-day periods. The distance between heavy line and blocks therefore represents the positive or negative calcium balance.

In the lower portion of the chart is shown the blood-plasma calcium.

Effects of Over-dosage by Parathyroid Extract.

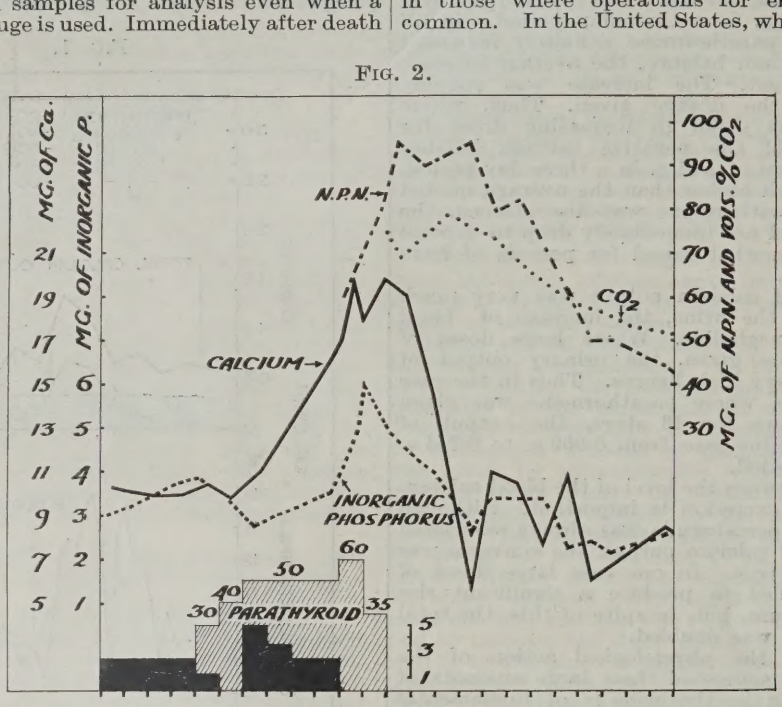
The work of Collip on dogs[27] brought to light a new entity—hypercalcæmia. This condition has since been found to occur in man, both spontaneously and as the result of parathyroid over-dosage. In Collip's observations on dogs no ill-effects were noted if the dosage of parathyroid extract was only sufficient to cause a rise in the serum calcium to 14 or 15 mg. per 100 c.cm. Large doses of the hormone, however, administered five times in the 24 hours often caused death within 48 hours of the first dose. Though in such cases the blood calcium rose to 20 or 21 mg.

per 100 c.cm., Collip made no claim that the hypercalcæmia was the immediate cause of death. In describing the condition of these animals he states that "the clinical manifestations of hypercalcæmia in dogs appear to be loss of appetite, dullness, drowsiness verging on coma, general atonia, and a failing circulation. The animals are also obviously dehydrated, the blood becomes very concentrated, and it becomes a matter of great difficulty to secure serum from blood samples for analysis even when a high power centrifuge is used. Immediately after death the blood in the heart and great vessels forms a firm clot."

Complete investigations of the blood chemistry showed that the inorganic phosphorus rose in the later stages of hypercalcæmia and that there was nitrogen retention. Thus in one dog the blood at death had a phosphorus content of 13 mg. per 100 c.cm. and a urea content of 111 mg.

During our investigations[22] a severe hypercalcæmia was produced inadvertently in one case by overdosage with parathormone.

FIG. 2.



Effect of parathyroid over-dosage on the chemistry of the blood.
The interval marks on the abscissa represent days.
A low calcium diet was given throughout. The black areas represent calcium lactate in grammes. The scale for parathyroid represents units per day. The calcium and phosphorus were estimated in blood-plasma, the non-protein nitrogen and carbon dioxide content in venous blood.

CASE 1. *Overdosage by Parathyroid Extract in Man.*—A man of 60 years (M. G. H., Reg. No. 272916, 1925), a house painter, was being treated for lead poisoning. It will be seen from Fig. 2 that he was being given a low calcium diet to which varying doses of calcium lactate were added. Calcium lactate was given for four days before commencing the parathormone. At this point, owing to an error in the interpretation of the orders, the calcium lactate was reduced and then omitted. During the next two days the dose was increased to compensate for the previous defects. Meanwhile the parathormone had been continued in increasing doses, until on the eleventh day the level of the blood calcium had risen to 19·8 mg. per 100 c.cm. It remained at this level for 48 hours; then, although all treatment had been discontinued, it fell only very gradually to normal levels during the next three days. The first effect on the plasma phosphorus was that it dropped to 2·7 mg. per 100 c.cm., but the late effect was a rise to 6 mg. per 100 c.cm., and this occurred 24 hours after the maximum rise in calcium. The pH of the blood was not estimated. The carbon dioxide content of the venous blood was 75 volumes per cent. The total base, protein, and water-content of the serum were normal (fixed base 168 c.cm. N/10 per 100 c.cm. serum; water-content, 92·2 g., protein, 5·9 g.). The non-protein nitrogen was followed from the time the blood calcium was first found to be raised. It showed a rise to a maximum or 95 mg. per 100 c.cm., this rise occurring two days after the maximum rise in calcium. During the next week it fell gradually to within normal limits.

The changes in the physical properties of the blood observed by Collip in dogs suffering from parathyroid overdosage were absent. Throughout the whole time the patient remained up and about, and, except for slight nausea and loss of appetite, appeared to be normal.

PARATHYROID TETANY.

Parathyroid deficiency occurs in clinical medicine both as post-operative tetany, following operations upon the thyroid, and as spontaneous hypo-parathyroidism, which is analogous to myxœdema. Both conditions are rare, and metabolic studies have shown them to be of great interest.

Post-operative Tetany.

Owing to the fact that radical thyroidectomy is not a common practice in this country, post-operative tetany is rare. It is not so in all countries, especially in those where operations for endemic goitre are common. In the United States, where it is customary to remove nine-tenths of the thyroid gland for exophthalmic goitre, post-operative tetany is more often seen than it is here. It is for this reason that Lahey[36] examines as a routine the specimens removed at operation, and, if any tissue suggesting parathyroid is found, he transplants it into the sternomastoid muscle, preferably reserving a portion for histological examination.

As an instance of the severe and ultimately fatal outcome which is sometimes seen in post-operative tetany, I will refer to a case[37 38] I saw in the Massachusetts General Hospital.

Aub's Case of Post-operative Tetany.—The patient was a girl who had been examined at the age of 17, having a history of a goitre, first noticed three years before. Tremor, tachycardia, and slight exophthalmos were found. The basal metabolic rate was plus 45 per cent. Later in the same year two extensive operations were performed constituting total thyroidectomy. Two months after the second operation, attacks of difficult breathing occurred and were later accompanied by severe carpopedal spasm and sometimes by convulsions. Two years later cataracts began to appear in both eyes, necessitating bilateral lens extraction.

On examination nine years after thyroidectomy, the skin was found to be dry and the axillary and pubic hair scanty. No thyroid tissue could be palpated in the neck. Chvostek, Trousseau, and Erb signs were positive. The blood calcium was 4·3 mg. per 100 c.cm., and the inorganic phosphorus 5·6 mg. per 100 c.cm. The basal metabolic rate was minus 18 per cent. 15 units of parathormone given daily raised the blood calcium to 6·7 mg. per 100 c.cm. in 18 days. When it reached this level the attacks of difficult breathing and tetany disappeared.

The output of calcium on a known low calcium intake was estimated during this treatment, and found to be excessively low. In fact the output was almost the same as the intake and much less than that of normal individuals on the same diet. This occurred in spite of the fact that she was being given 15 units of parathormone daily, which should have caused an increase in her calcium excretion. These figures for calcium excretion are lower than those found in any other disease and indicate that the low blood calcium is due, not to an increased permeability of the kidney or intestinal mucosa to calcium, but rather to a diminished endogenous calcium metabolism and a diminished demand upon the calcium reserves in the bones.

Unfortunately, the effect of parathormone gradually diminished in this patient. Initially the blood calcium had been raised by a dose of 15 units, whereas after some months doses of 100 units had no effect at all. The results to the patient were disastrous, for the persistent low blood calcium was accompanied by severe attacks of tetany, associated with bronchial spasm, laryngeal spasm, and unconsciousness, and in such an attack she died.

Aub [8] interprets this phenomenon as an "immunity" to parathyroid extract. He states that

"unfortunately, parathormone has several disadvantages, which make its long-continued clinical use unsatisfactory at present. First, its action varies markedly in different individuals. Thus, one normal individual will show a marked reaction, while another will get no effect from a similar dose of the same extract. Second, and more important, there is an immunity to the drug which has developed in many of our cases after a few weeks of treatment. When such an immunity appears, even very large doses of parathormone exert no influence on blood calcium or phosphorus. This loss of potency has lasted in one case for a full year, and is dependent upon a resistance to the preparation and not to a drainage of the storehouse of calcium, for an increased calcium excretion followed the administration of ammonium chloride after parathyroid had proved inert. This is apparently the only active principle of a gland of internal secretion which develops such an immunity, and this effect may possibly be dependent upon the protein still present in the extract."

Fortunately, chronic post-operative tetany is often a mild disease easily controlled by calcium therapy. The following case, which I have recorded elsewhere,[39] illustrates this.

CASE 2. *Post-operative Tetany.*—A single woman of 44 years (L. H., Reg. No. 40299, 1928). She was born at Wolverhampton, where goitre was endemic, and lived there until the age of 21. At the age of 18 she first noticed a swelling in the neck, which gradually produced pressure symptoms. At the age of 22 an extensive thyroidectomy was performed. Two weeks after this operation carpopedal spasm occurred. During the 22 years which followed, attacks of tetany frequently recurred, sometimes even affecting the facial, oculo-motor, laryngeal, and pharyngeal muscles.

On examination, although no thyroid tissue could be palpated in the neck, there were no signs of myxœdema. Trousseau, Chvostek, and Erb signs were positive. Visual acuity was normal, but examination with the slit-lamp showed opacities in each lens. The serum calcium was 6·8 mg. per 100 c.cm., and the plasma inorganic phosphorus 5·4 mg. per 100 c.cm. The basal metabolic rate was minus 5 per cent.

The rational treatment was to give a high calcium diet together with thyroid extract by mouth and parathormone by intramuscular injection. The average daily dose of parathormone was 30 units and of thyroid extract grs. 6. The patient completely lost all her symptoms as soon as the serum calcium rose to normal. After five days' treatment hypercalcæmia appeared (serum calcium 16·6 mg. per 100 c.cm.).

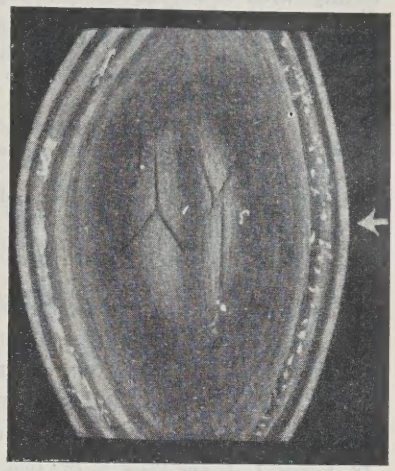
Further study of this case showed that, on a high calcium diet together with 10 g. of calcium lactate daily, all symptoms and signs of latent tetany were abolished and the blood calcium and phosphorus figures were restored to normal. During the whole of 18 months only one relapse has occurred, and that was due to a failure to take the calcium lactate. At all other times she has been free from tetany, twitchings, and restlessness at night. She has resumed writing letters and needlework and is now successfully employed as a housekeeper, whereas for the 22 years following the operation she had been disabled from work of any kind by stiffness of the fingers.

Spontaneous Hypo-parathyroidism.

It has now been definitely shown that just as myxœdema is, as a rule, a spontaneous hypothyroidism, so an analogous condition of the parathyroids exists. This is exactly similar to post-operative tetany, except that it is of spontaneous origin. Albright and Ellsworth [40] have recorded such a case.

Case of Spontaneous Hypo-parathyroidism (Albright and Ellsworth).—A boy of 14 was admitted to hospital for the relief of tetany. At the age of 8 attacks of laryngismus had occurred, followed the next year by carpopedal spasm. At the age of 10 Chvostek and Erb signs were positive, the blood calcium being 4·9 mg. per 100 c.cm. and the phosphorus 10·4 mg. The boy then became worse, so that at the age of 14 he was having each day about 15 attacks of carpopedal spasm, sometimes with momentary loss of consciousness. The blood calcium was still low and the phosphorus high. The basal metabolic rate was minus 6 per cent. Following the administration of parathormone there was complete relief. The blood calcium was raised to 16·2 mg. per 100 c.cm. and the phosphorus dropped to 4·7 mg. However, after discontinuing the injections of parathormone, symptoms returned in one week. Seen later, at the age of 15, the boy again had tetany; the blood calcium was 5·3 mg. per 100 c.cm., and the phosphorus 10·8 mg. The urine was normal. Radiograms of the bones showed no abnormality. Ophthalmoscopic examination revealed a subcapsular lenticular opacity in the right eye and a few lenticular opacities in the left.

FIG. 3.



Post-operative tetany (Case 2). Opacities in the lens, as seen with the slit lamp. *(From drawing by Theodore Hamblin Ltd.)*

A similar case [38] has been studied in a man of 52 with a history of attacks of tetany occurring over ten weeks, followed by failing vision. On examination Trousseau and Chvostek signs were found to be present. The blood calcium was 5·1 mg. per 100 c.cm, and the phosphorus 7·3 mg. The basal metabolic rate was minus 15 per cent. Opacities were found in the lenses of both eyes.

In these two cases there are many features which strongly suggest parathyroid deficiency. The low serum calcium with high plasma phosphorus is comparable to the findings in post-operative tetany and is the exact converse of what has been found in parathyroid over-dosage and hyper-parathyroidism. The administration of parathormone relieved the tetany, raised the blood calcium, and lowered the phosphorus. Finally the occurrence of lenticular opacities is comparable to what is found in post-operative tetany.

LESIONS OF ECTODERMAL TISSUES.

Cataract, brittleness and ridging of the nails,[41] loss of hair,[42] and defects in the enamel of teeth, giving rise to several transverse ridges one above the other: all these defects in ectodermal tissues have been described in tetany. None of these changes is common, but the first is met four times as frequently as any of the other three.

The association of cataract with tetany was first recorded about 50 years ago. It has been described in endemic tetany,[43] post-operative tetany, rickets, and spontaneous hypo-parathyroidism.[40] In 1906 Erdheim [44] observed the occurrence of cataract in rats six months after experimental parathyroidectomy. Thyro-parathyroidectomy in dogs may produce opacities in the lens within periods varying from three months [45] to two years.[46] Reports of 38 cases of human post-operative tetany associated with cataract have been published [47] to date. Since 1924 it has been possible,[48] by means of the slit-lamp, to demonstrate opacities in the lens where no visual disturbance exists. Such opacities were found [49] in the following case (Fig. 3).

CASE 2 (*continued*). *Post-operative Tetany.*—No opacities could be seen in the lenses by ordinary focal illumination, or with the ophthalmoscope and a high plus lens, but with the slit-lamp three types of opacity were seen. Opacities of one type were flaky white in appearance, in some places aggregated together to form a plaque, and situated under

the zone of disjunction, the space immediately beneath the capsule being quite clear. Opacities of another type, few in number, were angular and iridescent, usually blue and red; they occurred in the same situation as the flaky opacities. There were also a few powdery opacities in the depth of the lens, in the fœtal nucleus. (Mr. C. B. Goulden.)

By systematic slit-lamp examination of all cases under investigation, we have been able, where no disturbance of vision exists, to demonstrate such opacities in one case of renal rickets, one case of tetany with steatorrhœa, and one case of osteitis fibrosa of the focal type. In the study of disturbances of calcium metabolism these observations are clearly of great interest, but in the present state of our knowledge it is impossible to draw satisfactory conclusions from them.

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CASUALTIES AT THE WEIR HOSPITAL.—At this Balham institution there were, last year, 22,919 out-patients and 642 in-patients. Of this total 13,308 were casualty cases.

PRESSURE CAUSED BY ABDOMINAL TUMOURS.

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THE purpose of this paper is to narrate a few cases of rapidly growing benign ovarian tumours, to prove that such tumours may cause albuminuria which may be cleared up by tapping or removing the cyst, and to suggest that the pressure caused by the pregnant uterus may be an indirect factor in the causation of some of the cases of toxæmia associated with pregnancy. It is, however, first necessary to get a clear idea of the facts. There is no increased intra-abdominal pressure during pregnancy any more than there is after imbibing 20 pints of beer, a feat frequently performed "auf der Kneipe" in Germany. The abdomen may well be compared with a curio-cabinet. When the cabinet is empty and closed the pressure inside is the same as that of the atmosphere. Should the cabinet be partly or completely filled with curios, whatever their size and weight, the pressure in the cabinet remains the same. The pressure on any shelf, however, would be that of the atmosphere together with the weight of the curios resting on it. Similarly, the pressure in the abdomen remains a little less than that of the atmosphere, notwithstanding the introduction of 20 pints of beer, or 100 lb. of ovarian tumour, or 14 lb. of pregnant uterus. The weight of the tumour must, however, of necessity cause traction or pressure on some part or parts within the abdominal cavity, which will vary with the posture of the individual.

A large tumour displaces or disturbs the relative positions of the various parts of the alimentary canal and presses on the diaphragm, causing displacement of the heart and lungs. It may press on the blood-vessels and ureters at the brim of the false pelvis, and it may cause rotation or kinking of one or both ureters. In the recumbent position the pressure of the weight of the tumour must be thrown on the posterior abdominal wall and the structures lying on it. It would, therefore, not be unreasonable to expect such complications as indigestion, emaciation, constipation, pain, pyelitis, and œdema of both legs as the result of a large rapidly growing intra-abdominal tumour.

I propose to give a short résumé of five cases of rapidly growing benign ovarian tumours associated with a marked albuminuria which cleared up entirely after the tumours were removed.

CASE 1.—A thin and emaciated woman, aged 23, was admitted complaining of "difficulty in breathing." Shortly after the birth of her last child some five years before she had noticed a painless movable lump, the size of a duck's egg, in the lower part of her belly. This lump had increased but slowly in size. About five months before her admission, however, the tumour had commenced to enlarge very rapidly and when she was admitted it reached to the ensiform cartilage. Her urine contained albumin, red blood corpuscles, and pus cells. Owing to her extreme emaciation and the rapid growth, it was feared that the tumour was malignant and inoperable, and the patient was nearly sent home. On June 28th, 1928, an ovarian cyst weighing 16 lb. was removed under spinal anæsthesia. The patient made an uninterrupted recovery. Within 12 days the urine was quite normal.

CASE 2.—The patient, a thin woman, aged 21, was admitted complaining of a tumour in her belly and dyspepsia. One and a half years before she had noticed a lump in her belly and had thought she was pregnant. This tumour had gradually increased in size, until it reached to a point midway between the umbilicus and the ensiform cartilage. The urine contained albumin and many pus cells. On Oct. 5th, 1928, an ovarian cyst weighing 17½ lb. was removed under spinal anæsthesia. The patient made an excellent recovery and the urine became normal within a few days.

CASE 3.—A woman, aged 31, was admitted complaining of a large abdominal tumour. Seven years previously she had noticed a small round mass in the lower part of her abdomen on the left side. One year previously her abdomen had begun to increase rapidly in size. During the past four months she had twice been in the medical wards, where she had been tapped. Her urine on both occasions was normal. When admitted to my service she complained of a sense of fullness after meals and of obstinate constipation. She appeared to be a bag of bones and a tumour. She was cyanosed and frequently vomited dry phlegm. Her pulse was weak, and the rate was 112. Her respiration-rate was 39. Her systolic blood pressure was 90 mm. of mercury and the diastolic 55 mm. Her urine was loaded with albumin. The abdomen was enormously distended and its circumference measured 112 cm. at the level of the umbilicus. The veins on both sides of her abdomen were very distended, but there was no œdema of the legs. The patient appeared to be about to die. A week later, on April 17th, 1929, the abdomen was even more distended and the veins more marked. The apex-beat of the heart was in the third left interspace. There was marked œdema of both legs; the œdema of the body was increasing and there was anorexia and very obstinate constipation. On April 23rd the circumference of the abdomen at the level of the umbilicus was 119 cm.

On May 2nd it was 125 cm.; the œdema of the legs was enormous, and the circumference of the calves measured 36·5 cm. on the left and 34 cm. on the right. The tumour was tapped on May 5th, and 17 litres of fluid were withdrawn. On May 9th the circumference of the abdomen measured 86 cm. and that of the calves 25 and 24 cm. The apex-beat of the heart was in the fourth left interspace. The urine contained a trace of albumin. On May 20th the tumour was again tapped and 17 litres of fluid were withdrawn. Next day the cyst was removed under spinal anæsthesia and the patient made an excellent recovery. The cyst, together with the fluid removed on May 20th, weighed well over 40 lb. Her urine, which contained albumin, granular and hyaline casts, and a few pus cells, became absolutely normal within three weeks of the operation.

Note.—I went for my holidays on March 20th and did not return until the second week in May.

CASE 4.—The patient complained of a large tumour in her belly, together with oppression in the chest, some dyspnœa, and general weakness. About ten months before her admission she had noticed a mass in the lower part of her abdomen and had thought she was pregnant. This impression was heightened by the fact that she suffered from cravings, vomiting, anorexia, and insomnia. The tumour increased in size very rapidly. She was extremely thin when admitted on May 10th, 1929. The apex-beat of her heart was in the second left interspace ten inches from the mid-sternal line. The abdomen was enormously distended and large veins were visible on both sides and in the supra-pubic area. There was marked œdema of both legs and of both labia majora. The urine contained a few hyaline casts but no albumin. The tumour rapidly increased in size, and the patient became weak and ill and could not take her food. On May 16th the urine contained albumin and hyaline casts. The tumour was tapped and 18 litres of fluid were removed. The apex-beat was subsequently palpated in the fourth interspace. Next day the cyst was removed under spinal anæsthesia. The patient made an excellent recovery. The tumour, together with the fluid withdrawn on May 16th, weighed well over 40 lb. On May 18th the urine contained neither albumin nor casts, nor were any abnormalities subsequently discovered.

CASE 5.—The patient was admitted on July 20th, 1929, with a large tumour in the abdomen, which was very tender. There was marked œdema of both legs and of the abdominal walls. The temperature was raised and swung around 100·5° F. She was very anæmic. Her urine contained albumin, granular and hyaline casts, and a few pus cells. By July 25th her condition was much worse; she could not eat and had marked dyspnœa. On July 30th a large multilocular ovarian cyst was removed under spinal anæsthesia. During the operation fluid oozed out freely from the cut surfaces of the abdominal incision. The material in many of the loculi appeared to be pus, but the fluid was afterwards proved to be sterile. The patient made an excellent recovery. Six days after the operation the urine contained neither albumin nor casts, nor were these abnormalities subsequently detected.

There are three other cases to which I will merely allude.

In one case an ovarian tumour, closely bound to the uterus, was almost certainly the cause of a marked hydronephrosis (post-mortem examination). In another, an ovarian tumour burrowing deeply into the broad ligament was apparently the cause of pyelitis. In the third case a moderate-sized sausage-shaped ovarian cyst, adherent to the broad ligament, caused definite pressure on the rectum.

I have the notes of 47 cases of ovarian tumour. It is interesting to note that a trace or more of albumin was present in the urine of 37 cases before operation, and in many of the cases hyaline and granular casts and pus cells were also found. I have the notes of 24 cases of large fibromyomata uteri. Albumin was detected in the urine of 15 of these patients.

On the other hand, a patient was admitted on June 22nd, 1929, complaining of a large tumour in her belly and difficulty in breathing. She had given birth to a full-term child 17 days before her admission, and was surprised that her belly remained so large. She was positive that she had no tumour in her abdomen before she became pregnant, and I found the Siamese women to be very accurate in such statements. Except for the shortness of breath she was quite well. Her urine contained a few pus cells. The cyst when removed weighed about 40 lb.

I saw, in consultation, a short Chinese woman with an enormous ovarian cyst; the circumference of her abdomen measured 180 cm. at the level of the umbilicus, and I am sure that the tumour would have weighed well over 100 lb. She complained of no symptoms and appeared to be perfectly well. She could lie flat on her back without a pillow, and in that position presented a never-to-be-forgotten picture.

It is evident that rapidly growing benign tumours may cause all the symptoms that were postulated. In two cases albuminuria developed while the patients were under observation. In all the cases, not only the albuminuria, but also the casts disappeared after the tumour was removed. It is curious how the symptoms caused by apparently similar tumours vary. Dyspnœa is sometimes present early and sometimes never troublesome. Indigestion may or may not be a feature of the case, but anorexia is usually a marked concomitant of a large tumour if it has grown rapidly. Œdema is sometimes completely absent even when the tumour is large, and only rarely affects the abdominal walls or the external genitals. Anæmia is frequently encountered with such cysts, and is not unlike that associated with pregnancy. Intractable constipation is undoubtedly the most constant symptom from which these patients suffer.

Many of the women are gravely ill and would die if surgical treatment were not available. One patient died within a few days of her admission in a moribund state. Contrary to expectation, the cyst was found at the necropsy to be benign, and the cause of her death was a double pyonephrosis, undoubtedly caused by the tumour.

I submit that there can be no difference, from the mechanical point of view, between a rapidly growing ovarian cyst and a pregnant uterus. The ovarian tumour may upset the metabolism of the body and cause the urine to contain albumin and casts. It may kill the woman, usually by causing a pyonephrosis. On the other hand, the majority of large ovarian tumours do not cause any symptoms other than a sense of discomfort and fullness in the abdomen and constipation. Similarly, the bulk of the pregnant uterus may cause albuminuria and an upset of the metabolism, and this would be more likely to occur in primiparæ with their taut muscular walls and in association with hydramnios and multiple pregnancy. The fact is certainly established that albuminuria may develop while a woman with an ovarian cyst is under observation and disappear when the cyst is either tapped or excised.

PUBLIC ASSISTANCE IN GLASGOW.—The Glasgow Corporation has taken over five general hospitals (2315 beds), three mental hospitals (2984 beds), and three institutions for mental defectives (563 beds), with staffs numbering 1953. Besides these institutions the health committee will have an interest to the extent of one-half (133 beds) in Kirklands Mental Hospital which has hitherto been administered by the Govan and Lanarkshire Lunacy Boards. It is also proposed to make a joint arrangement with the public assistance committee for the use of the hospital section of the Southern General Hospital (600 beds). Four senior assistant medical officers are to be appointed.

ON RADIATION THERAPY IN CANCER.

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THE claim of any remedy to have specific action or immediate favourable effect on a disease process has as a general rule subsequently been proved unjustified. Almost always it has been found that the action of such a remedy was mediate—acting first upon some other tissue. This finding is so frequent that it constitutes some prima facie evidence that radium, or radiation, does not act directly on the cancer cell.

The belief is current that radium does act specifically and primarily on the cancer cell. It is freely admitted that it also acts on the normal tissues, but this latter action is regarded as subsidiary and rather as a nuisance, inasmuch as it may make the application of radium difficult or even impossible. The action of radiation is considered to effect some alteration of the cancer cell which adversely affects mitotic division and so interferes with the continuity of its growth. The present technique of radiation therapy is based on this conception. If it were correct, then radiation treatment should be relatively simple; any group of similar cancers of the same region and of the same extent should respond in the same manner to the same dose of radiation. This, however, is not found to happen; some cases do well, others do little, and some do not respond at all—that is, in a favourable manner. In an attempt to explain this variability the conception of radio-sensitivity has been evolved. The cancers which do not respond are termed radio-resistant and the ingenuity of the histologists has been fully exercised in attempts to distinguish between the sensitive and non-sensitive cancers. One very carefully examined series showed that it was the cancers of medium virulence from the histological standpoint which were the most sensitive.[1] Another series showed that it was the more anaplastic, or more virulent, which were the most sensitive.[2] Yet another experiment showed that the more virulent cancer was more sensitive in the animal, but was as resistant as a very resistant cancer in vitro.[3] If radiation did act specifically or immediately on the cancer cell, the response to radiation in vitro should be different from that actually found. When the living, growing cancer cell, in pure culture, with nothing to shield it, is exposed to radiation, the result should be certain and easy to attain; yet considerably more radiation is needed to kill this pure culture than is necessary to kill the same cancer in the living animal. The in vitro dose is always much larger than the in vivo dose.[4]

Some of our experiments appear to furnish evidence against the specific action of radiation on cancer.[5] After treatment with selenide of lead—that is, after impregnation of the tissues with a compound which is ionised* by hard X rays or gamma rays [6]—the application of these rays is followed by a rapid increase in the size of the neoplasm. According to the current theory, growth should have been lessened. Mitotic division must have occurred with greater frequency than before the radiation was applied. This is found to be the case both with cancer in man and implanted cancer in mice. Further evidence against the current view appears from consideration of the regional response to radiation therapy—e.g., the differences in response to radiation of a primary carcinoma of the tongue and its metastases in the lymph glands of the neck. In this case it is the same cancer, often with no histological differences, yet in the one place the cancer is very sensitive and in the other place very resistant. These findings appear to furnish some evidence that radiation does not act primarily upon the cancer cell. The alternative is that radiation acts upon the local and/or upon the general mesoblastic defence mechanisms.

The Stroma.

The local defence mechanism is probably the junction tissue—this is the mesoblastic defence barrier which tries, and apparently tries in vain, to limit the spread of the neoplasm. This junction tissue is not well known and its possible significance has not been appreciated. It consists of lymphocytes, plasma cells, monocytes and macrophages, various phases of fibroblasts, eosinophil and basophil leucocytes, and the blood and lymph channels. The relative predominance of each type of cell varies from case to case, but the total amount of junction tissue is proportional to the rate of growth of the cancer or to the defence which is being offered against invasion. Slowly growing cancer has much, quickly growing cancer has little junction tissue. It has been argued that the rapidly growing neoplasms grow over the junction tissue, and so there is little; the only counter to this is to consider that the cancer overgrows the junction tissue because it is inadequate. This junction tissue is frequently termed the stroma; stroma suggests a helpful adjunct to the cancerous process. I wish to point out the possibility of an opposite rôle. The literature shows a diversity of opinion on the relative action of radiation on this tissue and on the cancer cells. Dyroff [7] concludes that though the surrounding tissues show definite changes after radiation, yet these changes are less and occur later than the changes in the cancer cells. On the other hand, Roussy [8 9] notes that there are severe changes in the surrounding tissues but variable and patchy changes in the cancer cells. In the example given—radio-sensitive tongue growth with radio-resistant metastases—the sensitivity is directly proportional to the amount of junction tissue. The primary growth is usually rich in junction tissue, the gland metastases usually poor.

Our experiments appear to strengthen this view, though final proof is not claimed. There is evidence from chemical analyses and histological appearances that the selenide is localised in the junction tissue and not in the cancer to the same extent. Numerous estimations in this laboratory, as in most others, have shown that the cancer contains little, the spleen, kidney, and liver much lead.[10] The colloid would appear to be extracted from the blood by the cells of the reticulo-endothelial system throughout the body and by the cells of this system, the macrophages, which migrate to, or proliferate in the junction tissue. Now, deep X rays and gamma rays can ionise selenium [6] and, since the toxicity of the members of the selenium group is increased by greater dispersion the ionised selenium is thought to destroy the cell which contains it. If mice implanted with Twort carcinoma in the right flank are treated with radium after injection with lead selenide, few macrophages are found in the junction tissue and few star cells in the underlying liver. Similar treatment, but substituting a non-ionisable guaiacolate, shows more macrophages in the junction tissue and many star cells in the liver. These cells are demonstrated by intravital staining with Indian ink. It is considered that the increase of growth in the cancer after applying radiation to selenide-sensitised tissue is due to this damage to the junction tissue. The damaged junction can no longer inhibit the growth of the neoplasm.

Though the views of Besredka on the importance of the local cellular as opposed to the general cellular and humoral defences are not universally accepted, most unbiased observers agree that this concept of local immunity is the only one which explains many problems. Such a local defence appears to be a factor of importance in the cancer problem, especially from the chemotherapeutic and radiological standpoints. It has long been known that surgical removal of a primary growth might be followed by more rapid growth of the metastases; Besredka's theory gives an explanation; surgical removal also removes the

* Ionisation is to be differentiated from secondary radiation; the latter may be found to be helpful, as will be shown in an experiment below. Ionisation of the metalloid selenium appears to render it very toxic.

protective junction tissue. There is no other explanation at present. Similarly, the apparent "stimulation" of outlying metastases after "successful" radium application to the primary growth can be explained as damage to, or inhibition of the junction tissue from too heavy a dosage.

A different explanation is current—that there exists a stimulating dose somewhere at the periphery of the radiated zone. That there is a stimulating dose appears certain, but this dose is very small and has a narrow range. If stimulation were the explanation, then metastases should be stimulated at about equal distances from the primary, and contemporary recurrences should roughly be symmetrically arranged around the primary. This is not the case; recurrences are found quite near to, and at a long distance from the radiated zone, and it is very difficult to believe that the proximal and the distal metastasis each received this very small stimulating dose. On the whole the first explanation is considered the more likely, especially as it explains the "stimulation" which follows surgical removal, for here there is no possibility of radiation stimulation. This conception implies that, though the junction tissue fails in the end to prevent invasion and metastasis, it still keeps up its inhibitory action, both on the primary and on the outlying metastases.

The General Defence.

Local defence, as conceived from Besredka's theory and applied to the junction tissue, cannot be the only defence mechanism against the proliferation of a malignant neoplasm. Evidence for a general defence is obtainable from the behaviour of implanted cancer in animals and from clinical observation of cancer patients treated by medical methods. Successful treatment of cancer in man is accompanied by definite changes in the blood [12]—increase of small lymphocytes and eosinophil leucocytes and a diminution of that lipase which can spilt tributyrin. In addition we find more or less intense fibrosis around the growth and sometimes calcification in and around it. So far as can be said at present, no case of cancer in which these changes have not followed selenide treatment has shown any beneficial response. We call the cases which do not show these changes non-reactive, and the outlook is bad. On the other hand, satisfactory blood changes may occur in cases which do badly in the long run—that is, a reaction has been evoked but was apparently not sufficient to inhibit the cancerous process. In this latter group there is usually evidence of some action; the growths show an unusual softening which frequently amounts to liquefaction. There is a fair amount of evidence other than this that the small lymphocytes and the eosinophils play an important rôle in cancer.

The evidence for participation of the reticulo-endothelial system in the general defence mechanism in contradistinction to the action of the cells of this system, the macrophages, in the junction tissue) is abundant. When the activity of the system is diminished or paralysed by blockade—that is, when every cell has completely filled itself with the particles of an electro-negative colloid extracted from the blood stream—the implantation of cancer is facilitated. Erdmann [13] found that a certain number of tumours resulted from inoculation of cell-free filtrate of rat cancer and from choloroformed implant after blockade; this never occurred in the intact animal. Several observers [14 15] have found that mouse cancer could be successfully implanted into rats after blockade, whereas this never happens otherwise. A similar result has been found to follow partial removal of the reticulo-endothelial system, as occurs after splenectomy (until sufficient time has elapsed for regeneration) and after prolonged X radiation of the whole animal. Thus, Brüda [16] found that mouse cancer could be successfully implanted in rats after 30 minutes' radiation and within two weeks after splenectomy. On the other hand, certain virus cancers will not take after previous X radiation of the site of the implant; this is considered to be due to destruction of the fibroblasts, which are the necessary "culture medium" for these cancers. This same explanation has been given for the regression of implanted cancer in mammals after previous X radiation of the site, but this is wrong, for Vorländer [17] has shown that in rats the regression is accompanied by an ingrowth of fibroblasts into the regressing implant. The failure of mammalian implants to take after radiation may possibly be more correctly explained by a stimulation of the local mesoblastic defences, for it will be shown that such a stimulation actually occurs. Zacherl [18] noted that large doses of radiation crippled the reticulo-endothelial system like the blockade, and measured the damage by noting the diminution of the power of storing an inert electro-negative colloid. Large doses of radiation therefore appear to interfere seriously with the defences against neoplastic proliferation, and this defence is largely the rôle of the reticulo-endothelial system. Brüda [16] found that the plasma of splenectomised animals is a much better culture medium for cancer cultures than the plasma of the intact animal. Further evidence of the protective action of the spleen appears from the inhibiting power of spleen extract of rabbits "vaccinated" by injections of cells of mouse cancer against the taking of this same mouse cancer in mice.[20] Similarly, it had been found that an extract of rabbit spleen which has been stimulated by small venous doses of an inert colloid also inhibits the implantation of cancer.[19] The active principle of this stimulated spleen has been termed mesochymin; it inhibits the taking of implants, but has little or no action once the graft has really taken.

There are two ready methods of testing the reactivity of the reticulo-endothelial system as a whole and noting the variation in its activity which results from radiation and chemotherapy.

1. Kaufmann's test.[21] This is the response of the body to a constant irritant, a cantharides blister of constant size applied for a constant time. The amount of fluid and the number of lymphocytes and monocytes per c.mm. are noted. It is found that cancer patients yield fewer lymphocytes than normals, and that as cachexia progresses the yield further diminishes. Heavy dosage of radiation diminishes the number of lymphocytes but weaker dosage increases it. Mild X radiation of the spleen and ultra-violet radiation of the skin both increase the response in the direction of normality.[19]

2. Freund's and Kaminer's test.[22] The serum of non-cancer cases produces an appreciable cytolysis of a suspension of cancer cells; the serum of patients with cancer has less or none of this action. Zacherl [19] has confirmed this test and has found that, though heavy X radiation lowers what response there is, lesser doses tend to increase the response in the normal direction. That this, again, is due to stimulation or depression of the reticulo-endothelial system would appear from Perachia's [24] finding that Freund's and Kaminer's test became negative after splenectomy.

It is suggested that instead of guesses at the response which is considered likely in any cancer—e.g., so many kilovolts or so many milligramne-hours—the reactivity of the patient should be tested by a small dose of radiation on the cancer. By testing the patient before and after this trial radiation it should be possible to determine more accurately the patient's reactivity and thus modify the dosage. It should also be possible to measure the responses and, it is hoped, watch the reactions become more normal as improvement follows. Then, too, those substances which have been shown to exert an action on the junction tissues—selenide of lead and certain fluorescin derivatives [23]—should be carefully employed. The selenide must not be used before radiation.

Summary.

There is plenty of evidence that radiation affects the cancer cell adversely, probably by inhibitory action on mitotic division, and thus prevents the continuity of the cancer process. It is here considered that this immediate action may be less important

than, or even be produced by, the mediate action of radiation which takes place: (1) locally in the junction tissue, a stimulation of its defence; (2) generally in those parts of the mesoblastic tissues which are concerned with defence mechanisms, especially certain cells of the blood and the cells of the reticulo-endothelial system.

Acceptance of these views will entail further modification of radiation technique in the direction of smaller doses applied for longer times, or at repeated intervals, and also greater screenage. This is the trend of radiation therapy, except teletherapy, which is still under trial in this country, though it has been discarded in others. A fresh viewpoint may help to prevent the disappointment for which the current conception of radiation and the resultant technique are responsible.

It is impossible to refer to all who have afforded some of the data on which this paper is based, as they are too numerous. Some have been noted in the references. Some are indirectly due to Dr. W. C. Stevenson, of Dublin, and some to Dr. J. A. Murray and the staff of the Imperial Cancer Research Fund. I am much indebted to my assistants of the Bristol Royal Infirmary Cancer Research Laboratory.

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ANGINA PECTORIS AND CORONARY DISEASE.

BY DOUGLAS HUBBLE, M.B. LOND.

IT might be thought impossible, after a century and a half of research, to devise a new theory of the causation of angina pectoris, but quite recently a reputable American author[1] conceived the idea that the pain in angina pectoris was due to the stretching of the coronary arteries following the rupture of calcareous plaques in their walls. Other theories which are equally improbable can be unearthed in the literature, and any theory advanced must be scrutinised in the light of the fact that undoubted angina pectoris has now been described in association with a wide variety of pathological states.

These conditions include coronary artery disease, aortitis, aortic regurgitation, severe anæmia, myxœdema, paroxysmal tachycardia, and arterio-venous aneurysm. Keefer and Resnik,[2] in a comprehensive review of the subject, support the view that in all these conditions the common factor is an anoxæmia of the myocardium. I accept this theory, but it is interesting to review those theories of the pathogenesis of angina pectoris which are, at the moment, most strongly supported. They incriminate three anatomical structures—the coronary arteries, the aorta, and the myocardium.

The Coronary Arteries.

This theory, in its original form, stated that the underlying factor in all cases of angina pectoris was disease of the coronary arteries. It is the oldest of all theories and was first advanced in the day of Jenner and Parry; and Huchard,[3] who made brilliant investigations in support of this theory, wrote—

> "Cette énumération n'est pas inutile pour donner la preuve qu'un auteur qui voudrait s'approprier, avec la priorité de cette théorie, le labeur de tout un siècle, commettrait un déni de justice à son profit."

Although it has been strongly assailed, this theory has received a great fillip in recent years by the widespread recognition of the syndrome of coronary thrombosis. Parkinson and Bedford,[4] in their very able discussion of this condition, write: "we believe that the study of coronary thrombosis has nailed angina for ever to the tree of decaying coronary arteries." Without supporting this view in its entirety it is true that the pain of cardiac infarction and the pain of angina pectoris are sufficiently similar to suggest a common origin for both conditions. Allbutt[5]—writing, however, in 1915 before the syndrome of cardiac infarction was thoroughly appreciated—stressed the differences between the two conditions, and many authors since his day have elaborated them.

There were two original objections to the complete acceptance of the coronary theory. It was soon recognised that many cases which were found at post-mortem examination to have extensive coronary disease, even with obstruction, had no history of attacks of angina. Investigations into the coronary circulation have done away with this first objection. It is now known that the anastomosis between the various branches of the coronary system is often very extensive and sometimes, even in an acute obstruction, so free that the supply of blood to the myocardium is not seriously jeopardised and no anginal pain develops. The second objection is not so easily dismissed. Cases of angina pectoris in which there is no demonstrable lesion of the coronary arteries have frequently been described in the literature. These cases have been examined very critically by many authors and the conclusion is inevitable: angina pectoris can occur in the absence of any coronary lesion.

Coronary spasm.—To account for these cases the ingenious and attractive idea of a spasmodic constriction of the coronary arteries was mooted, but it has remained a hypothesis which is not very susceptible of proof; and if the myocardial anoxæmia theory is accepted it seems to do away with the need for any theory of coronary spasm. Keefner and Resnik[2] oppose this further development of the coronary theory on other and more debatable grounds. Firstly, they say that it "is difficult to understand how vasoconstriction could affect a coronary artery which was already altered by coronary sclerosis." But surely the theory of coronary spasm was advanced to account for those cases in which there was no demonstrable coronary disease. No one, to-day, postulates vasoconstriction in a calcareous artery. It is enough for the production of angina pectoris that when the myocardium calls for an increased blood-supply the diseased artery fails to dilate. Again they say, "one would expect, if coronary spasm were the actual cause of angina pectoris, to find fairly frequent examples of myocardial infarct without organic obstruction of the coronary arteries." This seems an unreasoning argument. Is it rational to expect a temporary and relative diminution in the blood-supply of the myocardium to result in

the production of a myocardial infarct? They have previously admitted that a permanent and absolute occlusion of a branch of the coronary circulation may not result in an infarction owing to an adequate coronary anastomosis. In their third objection to the theory of coronary spasm it seems likely that they are on surer ground. They quote the animal experiments of Anrep and Segall,[6] which prove that vasoconstriction of the coronary arteries is due to vagal action—and stimulation of the vagus is always accompanied by a slowing of the heart rate—and they quite rightly point out that there is no characteristic alteration of the pulse-rate in angina, and certainly no constant deceleration.

To sum up the present position with regard to the coronary theory one may say that, although a coronary lesion is present in most cases of angina pectoris, yet it is impossible to accept the theory as a complete explanation for all cases of angina pectoris; and that the occurrence of coronary artery spasm as a factor in the causation of angina pectoris is by no means proved, and is an unnecessary hypothesis unless there is proved to be no condition present which is capable of producing an anoxæmia of the myocardium.

The Aorta.

Clifford Allbutt[5] first incriminated the aorta. His view was that the pain of angina was due to tension of the first part of the aorta, which was invariably the seat of an inflammatory lesion. Sudden death occurring in angina was in his opinion due to vagal inhibition of the heart's action. The main support for this theory rests on the finding of an aortic lesion in most cases of angina pectoris, and it is undoubtedly true that the post-mortem records of patients who have suffered from angina during life show, as a rule, either aortic atheroma or syphilitic aortitis. The relevant objections to this theory may be briefly stated:

(*a*) Many cases of angina pectoris have been recorded in which no disease of the aorta was demonstrated after death. Allbutt confessed, for example, that he was unable to account for the occurrence of angina in aortic regurgitation of rheumatic origin.

(*b*) Aortic lesions occur very frequently without anginal symptoms. For instance, on this theory, it is difficult to account for the rarity of angina pectoris in aneurysm of the aorta.

(*c*) The average age incidence of syphilitic aortitis is a decade earlier than the average age incidence of angina pectoris.

(*d*) The theory of death from vagal inhibition is inadequate. Lewis[7] writes: "To accuse the vagus when unexpected syncope terminates life, in the absence of clear evidence of its responsibility, is unjustifiable." It is probable that sudden death in angina pectoris results from ventricular fibrillation, and there is no experimental evidence to show that fibrillation of the ventricle is dependent on vagal stimulation. Again, there is no evidence that the vagus is stimulated during an attack of angina pectoris; there is neither slowing of the heart-rate nor any evidence of auriculo-ventricular block.

(*e*) The high rate of incidence of aortic changes accompanying angina pectoris is well explained by an alteration in the coronary circulation. Aortic atheroma is often accompanied by coronary atheroma and in syphilitic aortitis the mouths of the coronary arteries are often obstructed. It has also been recently suggested by East and Bain[8] that advanced atheroma of the aorta results in a diminished elasticity which impairs the head of pressure regulating the coronary circulation.

Wenckebach has given his strong support in recent years to the aortic theory without, however, adding very much to the evidence already marshalled by Allbutt.

The Myocardium.

There has been a growing consensus of opinion in this country and in America that, whatever may be the exact cause of the pain in angina pectoris, the original impulse arises in the cardiac muscle. Three main theories have been advanced which involve the myocardium.

(1) *Myocardial exhaustion.*—Sir James Mackenzie was responsible for this theory,[9] which suggests that the underlying factor in angina pectoris is an acute cardiac exhaustion. This hypothesis is an example of the over-simplification which was Mackenzie's tendency in later years in his endeavour to strike to the foundations of a subject. It is obvious that he was fully convinced of the importance of coronary disease as a factor in angina but, being puzzled by those cases in which the coronary arteries were not involved, he resorted to the idea of myocardial exhaustion. This conception is, in any case, too vague to be satisfactory, but there are also many objections to it.

Angina pectoris declares itself in the heart which has a reasonably good reserve and if, later, that heart should fail (true myocardial exhaustion) then the anginal attacks tend to disappear. Why should angina appear in a heart which is exhausted by reason of coronary disease, aortitis, or aortic insufficiency, and yet be invariably absent in a heart which is exhausted by the handicap of a stenosed mitral valve? In his last book,[10] written just before his death, Mackenzie says no word of this theory.

"Although," he writes "one can trace angina pectoris to the heart muscle, and although we can recognise from the various illustrations given that voluntary muscles made to contract when deprived of blood give rise to pain, and although it can be demonstrated in many cases of angina pectoris that the heart muscle was deprived of blood and that pain resulted when there was a demand for more blood, as on effort, yet it is not quite clear how these impulses, which could not arise from a greatly increased number of muscle cells contracting, give rise to pain."

He had left London for St. Andrews and turned his attention from the cause of angina to the actual mechanism of pain-production.

(2) *Myocardial distension.*—Poulton,[11] in an endeavour to bring anginal pain into line with what may be called the Guy's Hospital theory of pain-production in hollow muscular organs, writes of angina pectoris: "On the analogy of œsophageal and gastric pain, cardiac pain would be due to a tonelessness and consequent stretching of the muscle, and amyl nitrite may possibly act by stimulating the muscle to contract down on its contents." It is possible that the pain of congestive heart failure may be brought about in this way,[12] but there are several reasons for believing that the pain of angina pectoris, being different in character, has an entirely dissimilar origin. The objections to this theory are:

(*a*) That the pain of angina pectoris tends to disappear when congestive heart failure—i.e., tonelessness and stretching of the muscle—supervenes.

(*b*) Many cases are recorded which suggest that when cardiac infarction occurs in a heart which is already failing—i.e., in a distended heart muscle—the typical anginal pain is absent.

(*c*) There is no evidence of any sort to show that amyl nitrite causes the cardiac muscle to contract down on its contents. According to Cushny[13] and Dixon,[14] amyl nitrite has no direct action on the heart muscle, except in toxic doses in the frog when the contractions are weakened—as would be expected from the action of the drug on unstriated muscle.

(*d*) There seems to be no special reason, except on morphological grounds, why the origins of gastric and cardiac pain should be analogous, even if Poulton's explanation of gastric pain is accepted. The structure, function, and properties of the two muscles are so dissimilar. The fact seems to be that there is no condition occurring in the stomach or œsophagus which is at all comparable to angina pectoris.

(3) *Myocardial anoxæmia.*—This last theory maintains that the pain of angina pectoris arises in the cardiac muscle and is invariably due to temporary oxygen-lack. Stated more broadly,

anginal pain arises from a disproportion between the oxygen demands of the cardiac muscle and its available oxygen supply. This definition thus includes the pain of coronary thrombosis. This theory is but an extension of that development of the coronary theory which says that angina is due to an inadequate coronary circulation; it is more precise in definition and it spreads the net a little wider so as to include cases not covered by the coronary theory. It is no new theory, but it has recently been elaborated by Keefer and Resnik[2] in an admirably comprehensive review (to which I am indebted); it does not differ so deeply from the coronary theory as these authors suggest, but it is definitely a distinction which is worth emphasising. In a review of the literature they state that "when the facts are complete it is possible to demonstrate anoxæmia in practically every case." That this is so in angina with coronary artery disease is plain, but in many other conditions the anoxæmia factor is not so obvious. Three examples given by Keefer and Resnik may be quoted. A common condition with which angina is sometimes associated is aortic insufficiency, and both Allbutt and Mackenzie were puzzled to explain this connexion; Smith and Miller[16] have shown that the blood flow through the coronary arteries was actually decreased in experimental aortic insufficiency in dogs and that this disease was due to a lowering of diastolic pressure —sufficient evidence that in aortic regurgitation there is an anoxæmia of the myocardium. Several cases of angina occurring in association with severe anæmia have been recorded, and many observers have pointed out that the attacks of angina were dependent on the degree of anæmia and that as the blood picture improved the angina disappeared. In these cases it is impossible to escape from the conclusion that the angina must be dependent on a diminished oxygen-supply to the cardiac muscle. Again, attacks of angina have been described in cases of arteriovenous aneurysm, a condition which results in a lowering of diastolic pressure and a diminished flow through the coronary arteries.

If it is accepted that anoxæmia of the myocardium is present in almost every case of angina pectoris can it be shown that this condition will produce the symptoms of angina? It has to be admitted that while the evidence for this is strong, it is not conclusive, nor does it seem likely that direct proof will ever be available; but the case for this theory has been enormously strengthened by the recognition of the syndrome of coronary thrombosis—a condition which causes acute anoxæmia of part of the myocardium. The distinction between the pain of simple angina pectoris and of coronary thrombosis is solely one of degree, and in essential characteristics the pain in the two conditions is identical. The experiments of MacWilliam and Webster[13] with skeletal muscle provide a suggestive analogy. They found that when the blood-supply of the arm is cut off by constriction pain is not experienced, even for 20 minutes, providing the arm is at rest, but that when the muscles are made to contract the arm is very much more quickly fatigued than the normal arm, and that when the fatigue-point is reached there is very severe pain. If this analogy is permitted, anginal pain may result because the cardiac muscle has to go on contracting notwithstanding an anoxæmia. This theory also provides an adequate explanation of the sudden death which takes place frequently in angina pectoris. It is now generally believed that the sudden death is due to ventricular fibrillation, and Sir Thomas Lewis showed 20 years ago[17] that ligation of the coronary arteries in animals caused ventricular fibrillation and death. It seems probable therefore that instant death due to ventricular fibrillation is particularly likely to develop in conditions which produce anoxæmia of the myocardium. This theory does not explain all the problems of angina pectoris and several questions remain unanswered but, to an impartial observer, it is certain that there are many fewer objections to this than to any other theory and that it is, at least, the one theory which is not at any point inconsistent with the enormous mass of recorded fact.

Coronary Thrombosis and Angina Pectoris.

There has been much discussion concerning the distinction between the pain in simple angina and the pain in cardiac infarction. Allbutt,[8] for example, in maintaining an aortic origin for angina, stressed the differences in the two conditions, while others have pointed to their essential similarity as a proof of the coronary hypothesis. Much has also been written of the differential diagnosis of the two conditions, and confusion has arisen because insufficient distinction is made between coronary disease with and without cardiac infarction. Lambert,[18] for example, in an otherwise excellent article on cardiac pain, gives a differential diagnosis as follows.

Coronary Disease.	*Angina Pectoris.*
Pain often epigastric.	Pain sternal.
Pain of long duration.	Pain temporary.
With dyspnœa.	Without dyspnœa.
Occurring at night.	Brought on by effort.
Unrelieved by nitrites.	Relieved by nitrites.
Râles in lungs.	No signs in lungs.
Fall of blood pressure.	Blood pressure unaltered or raised.
Arrhythmias present.	Arrhythmias absent.

It is obvious that the last four signs in the first list are not signs of coronary disease at all, but signs of cardiac infarction and, as the first part of this article has amply demonstrated, angina pectoris itself is often evidence of coronary disease.

The differential diagnosis between simple angina pectoris and cardiac infarction is sufficiently obvious. In the latter condition the duration of the attack, the collapse, the pyrexia, the fall of blood pressure, the nausea and anorexia, and the signs of congestive heart failure in the liver and lungs soon establish a diagnosis beyond doubt. But the diagnosis between a shower of anginal attacks which is the prelude to cardiac infarction and attacks of simple angina pectoris is not so straightforward, yet it is important, from the point of view both of prognosis and of treatment, to make this diagnosis. The following case illustrates well the various diagnostic points.

The patient was a male aged 63. On May 13th, 1929, he complained of chest pain which had started three weeks previously. The pain was situated over a wide area between the lower end of the sternum and the left nipple, and radiated up to the jaw and the left side of the head. The pain commonly started when he was walking but occasionally the onset bore no relation to any effort; in fact, on the morning he was first seen, the pain had come on at 6.30 while he was lying in bed. Its character was gripping and constricting, and it was moderately severe. The duration was usually a quarter of an hour, but occasionally it lasted as long as three hours. He stated that during the previous winter he had been increasingly dyspnœic on exertion. On examination his heart was enlarged, with the apex-beat half an inch outside the left nipple line, and the sounds were distant. His blood pressure was 162/104 mm., and there was a trace of albumin in his urine. The pulse-rate was 68. The brachial artery was thickened and easily palpable. A diagnosis of angina was made, though it was realised that the symptoms were slightly atypical. He was put to bed and given tabellæ of trinitrin (gr. 1/100), which he was told to take at the onset of his pain. This he did, and when next seen he said that one tablet gave him complete relief from his pain within five minutes but that his pain invariably returned in two hours. This relief given by nitrites was thought to confirm a diagnosis of true angina. Four days later he stated that his pain was distinctly more severe and more persistent than when he had come to bed, and the fact was puzzling. The next night at 11.30 he had a severe attack of his pain, which was not influenced in the slightest degree by trinitrin; this attack for the first time was accompanied by dyspnœa and at 5.30 the next morning he had a similar attack which persisted until he was seen at 11 A.M., in spite of the fact that during these few hours he had taken gr. 1/25 of trinitrin and inhaled vigorously a 5 minim capsule of amyl nitrite. At midday his pain became agonising; he was pale, cyanosed, sweating, and restless. His temperature was subnormal, his pulse-rate, though regular, had dropped to 50, and his heart sounds were weaker than before his acute

attack. His systolic pressure had dropped to 106 mm. It was then realised that his heart was infarcted, and he was given morphia and all vasodilators were withdrawn.

Next day there was no doubt about the diagnosis. He showed the characteristic appearance of cardiac infarction. His tongue was heavily furred, he had vomited once, there was no desire for food; his stomach, he said, was unsettled. His blood pressure was 108/80 and his temperature was 101°. His pulse was regular and the rate had risen with the pyrexia to 74. The heart sounds were weak. There were no signs of pericardial friction or passive congestion. His pain had disappeared but there was a resultant heavy soreness and stiffness over a wide area of the chest and the left side of the face. He was emphatic in his opinion that the only thing that differentiated his pain of the day before from the pain of the previous three weeks was its severity. Situation and character were identical. Two days later he desired to defæcate, and having tried to use the bed-pan and failed he was allowed by his nurse to rise from his bed and use the commode. Ten seconds after getting back to bed he complained of an acute pain in his chest, collapsed immediately, and died 70 hours after the onset of the infarction.

This is clearly a case of coronary thrombosis and cardiac infarction with prodromal anginal attacks of increasing severity lasting over several weeks. Parkinson and Bedford[4] mention nine cases of cardiac infarction with prodromal anginal attacks; they refer to it as the ingravescent anginal state and it corresponds to the status anginosus of earlier authors. It is impossible to be sure what is happening in the heart in the prodromal anginal attacks; either the attacks are dependent on a gradual narrowing of the lumen of a main branch of the coronary circulation or, less probably, they are due to the thrombosis of small branches of the coronary arteries—branches too small to give the characteristic picture of cardiac infarction, owing to an adequate collateral circulation. It is certain that in patients who have anginal attacks the coronary circulation is always hovering on the edge of inadequacy and the cardiac effort which may produce an attack depends on the condition of the coronary arteries.

When the coronary arteries are but slightly diseased, strenuous effort may be necessary to bring about the relative anoxæmia of the myocardium; when the walls of the arteries are grossly damaged they will be unable to adjust their lumina to the call for an increased blood-supply, and only slight effort is needed to produce an attack. In coronary thrombosis the blood-supply is definitely obstructed and the attack may occur when the heart's requirements are minimal—with the patient in bed at rest.

Diagnosis of Prodromal Anginal Attacks.

From the point of view of treatment it is important to differentiate these attacks from simple angina pectoris. Unlike typical angina, the attacks may come on independently of effort or emotion and are not relieved in a short time by absolute rest. The patient himself realises this, and it is unusual to find the complete immobility associated with angina. The initial attacks may be of short duration, but in hours or days they return with increased frequency and greater severity until they merge into a prolonged anginal state which culminates in typical cardiac infarction. The whole process may occupy days or weeks. The attacks are often, at their height, accompanied by dyspnœa. Some authors have attempted to differentiate these prodromal anginal attacks from simple angina by differences in the character, the position, and the intensity of the pain, but, as in the case quoted above, these points usually offer no help in diagnosis.

The Reaction to Nitrites.

Great stress has been laid by various authors on the fact that the nitrites, while giving relief in angina pectoris, give no relief in coronary thrombosis or its prodromal anginal attacks, and this fact is often quoted in the differential diagnosis. A consideration of the case quoted above does not, however, bear this out. The nitrite relieved the patient's pain for the period of its pharmacological action, and when the effect of the drug wore off his pain returned with the same or greater intensity. This reaction to nitrites, if proved to be constant, will be enough of itself to give warning of the threatening thrombosis.

The mode of action of nitrites in relieving the pain of angina pectoris is still doubtful; they probably act both by lowering the systolic blood pressure and by dilating the coronary arteries—i.e., at the same time diminishing the work of the heart and increasing its blood-supply. It is impossible to say which of these two actions is the dominant one, but it is probably correct to say that the nitrites can have little or no vasodilating effect on grossly diseased coronary arteries. In the case quoted above the nitrite may have relieved the patient's pain by lowering the blood pressure and lessening the work of the heart, but it is also probable that it had a vasodilating effect, not on the artery in which the thrombosis was gradually occurring, but on other vessels in the collateral circulation, thus relieving temporarily the anoxæmia in that part of the myocardium which was threatened with infarction. Nitrites are obviously contra-indicated in cardiac infarction, as many authors have pointed out, but a consideration of this case suggests that they are also dangerous in cases of ingravescent coronary thrombosis; it is noteworthy that after the temporary relief from the nitrite had passed the pain returned, often with increased severity. It seems probable that by lowering the blood pressure the nitrite accelerated and aggravated the cardiac infarction, for animal experiment has shown that to get the largest area of infarction it is always necessary to lower the blood pressure artificially.[19] This demonstrates the importance of making a differential diagnosis between angina pectoris and a developing coronary thrombosis; for the remedy which is beneficial in simple angina pectoris is actually dangerous (though apparently of temporary benefit) in the prodromal anginal attacks of coronary thrombosis.

The diagnosis of these prodromal anginal attacks rests, then, on five points: (1) the onset unrelated to effort; (2) the failure of rest to relieve the pain; (3) the recurrence and increasing duration of the attacks; (4) the accompanying dyspnœa (not invariable); (5) the typical reaction to nitrites.

When the attacks proceed to cardiac infarction then the diagnosis is straightforward, thanks to the careful researches of recent years in America and in this country.

Derby.

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MANFIELD ORTHOPÆDIC HOSPITAL.—The annual report of this institution, in the outskirts of Northampton, states that last year the work expanded in all departments, 235 patients were admitted and over 1000 out-patients were treated. Satisfaction is expressed that patients who are not cripples in the ordinary sense of the word but who suffer from deformities and disabilities which would ultimately result in crippling, are being dealt with at an early stage.

THE SIGNIFICANCE OF SWEATING IN MAN.*

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THAT the regulation of the temperature of the body is almost the sole object of sweating has been a current view for many decades and, so far as I am aware, no serious objection has ever been raised against this opinion. I have, however, long been sceptical about its truth, as medical writings often state that sweating may be provoked not only by an increase of the temperature of the surroundings or muscular exercise but also by emotion or mental stress. It is quite reasonable that the former, which always result in an increase of the temperature of the body, cause sweating—a process of heat elimination. But we can hardly understand why the latter, which have little bearing on the body temperature, should also be a cause of sweat. There seems to be room still left for the assumption that sweating may have some other purpose.

In this laboratory my collaborators (Dr. K. Ikeuchi, Dr. T. Kosaka, and others) and I have been engaged in research work on the subject of sweating for about eight years. As a part of this, we made experiments with the purpose of answering the above question, and recently we have come to the conclusion that sweating in man is, in respect of the features of secretion as well as of its physiological significance, not uniform all over the body surface, and that it should be classified at least into two different categories. In the present paper I shall discuss the essential points of our experiments. All were carried out on man. The measurement of sweat was not made on the whole body surface, but on an area of skin of about 20 sq. cm. The amount of sweat discharged from this area every five minutes was determined and, using this amount as the unit, changes in sweating were observed for considerable periods of time. Such a measurement was, as a rule, carried out on two different parts of the body surface at the same time. The portions of the skin at which the measurements were to be made were covered with celluloid dishes, 20 sq. cm. in diameter, furnished with two side tubes through which a dry air current passed over the skin and was introduced into tubes containing calcium chloride. The gain in weight of the tubes was measured every five minutes. The temperatures of the same portions of the skin and in the rectum were determined by the thermo-couple method.

Classification of Sweating in Man.

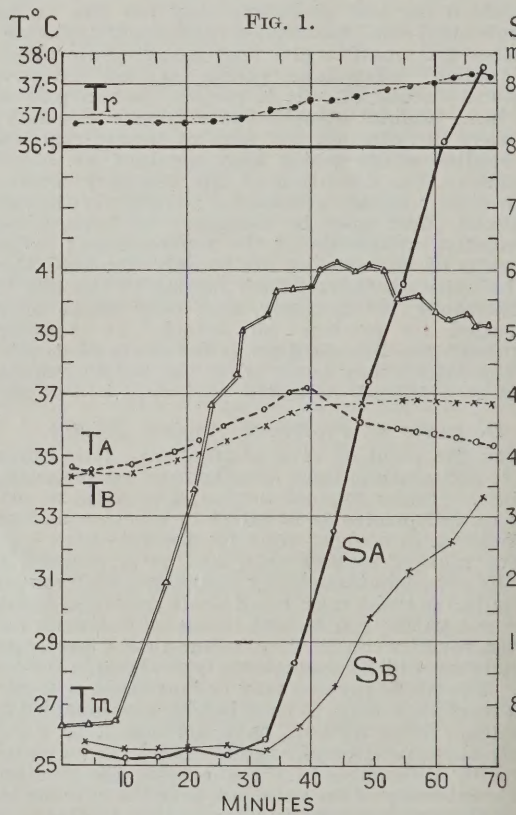
Using this method, we observed sweating provoked by many different causes. The sweating caused by an increase of room temperature may be regarded as the most common type. Fig. 1 shows one example of such experiments, in which the measurements were made at the chest and the thigh. The tracing in this figure lettered by Tm represents the room temperature; SA, the amount of sweat per 20 sq. cm. per five minutes at the chest; SB, that at the internal surface of the thigh; TA and TB, the skin temperatures measured at the same parts of the skin, and Tr, temperature in the rectum. Sweating begins some 30 minutes after the rise of room temperature and increases rapidly. Though the amount of sweat is very different between the two parts of the skin, the time of the outbreak of sweating is almost the same, and its further changes also coincide. A great number of such experiments were made at many different parts of the skin, but the results were almost the same as shown in the figure.

* Translation of a lecture given by the author at the fourth annual meeting of the Japanese Association for the Advancement of Science.

In another series of experiments local heating of one arm or one leg with dry hot-air baths was used to cause sweating. In this case, sweating also appeared on the whole body surface and was never restricted to the heated portion alone. This may be seen in Fig. 2. In this experiment the left leg only was exposed to a hot-air bath, the temperature of which is indicated by the tracing Tm. Sweating was measured at the corresponding portions on the outer surfaces of both legs, one was heated (SA), and the other was not (SB). Tracings SA and SB show that sweating occurred at the same time and changed in the same manner at these two parts, the only difference between the two being that the amount of sweat was greater on the heated side.

According to these experiments, the sweating caused by heating inevitably appears all over the body surface and never locally, even when the heating is confined to a small portion of the skin surface. But the palms of the hands and the soles of the feet do not conform to this general rule. These parts are those where sweat glands are present most densely, and our experiments proved that, in the state of so-called insensible perspiration, the amount of water discharged from the skin was distinctly larger at these parts than at any other parts of the body surface. It is peculiar, however, that the perspiration from these parts does not increase at all from ordinary thermal causes; in other words, the palms and the soles do not sweat under high atmospheric

FIG. 1.



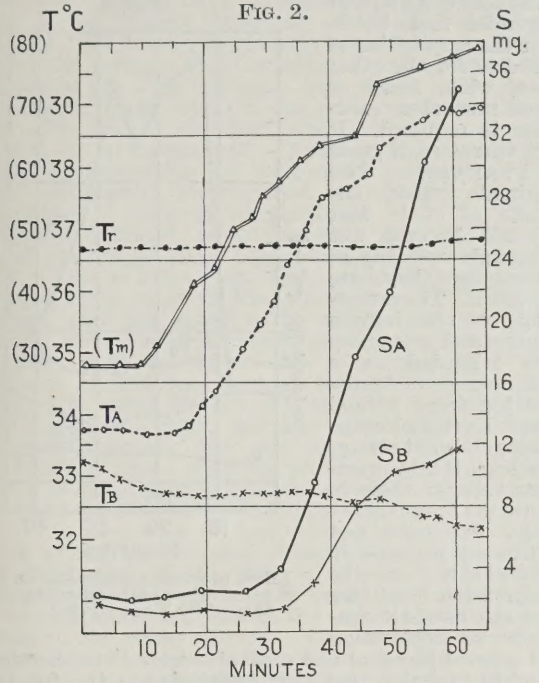
Sweating caused by increase of room temperature.

temperature which causes a profuse sweating on all the remaining parts of the body surface. This is shown in Fig. 3. In this experiment sweating was measured on the palm (SA) and on the chest (SB), and the room temperature (Tm) was raised. At the beginning the amount of perspiration was much larger on the palm than on the chest, but the former did not change when the room temperature became high, while a considerable sweating appeared on the chest. Our own experiences agree with the results

of this experiment, because the sweat may run down from the forehead or many other parts of the skin in the summer, but never from the palms or the soles.

This does not mean, however, that the sweat glands of the palms and the soles have no ability to increase their secretion. Though they do not react

FIG. 2.



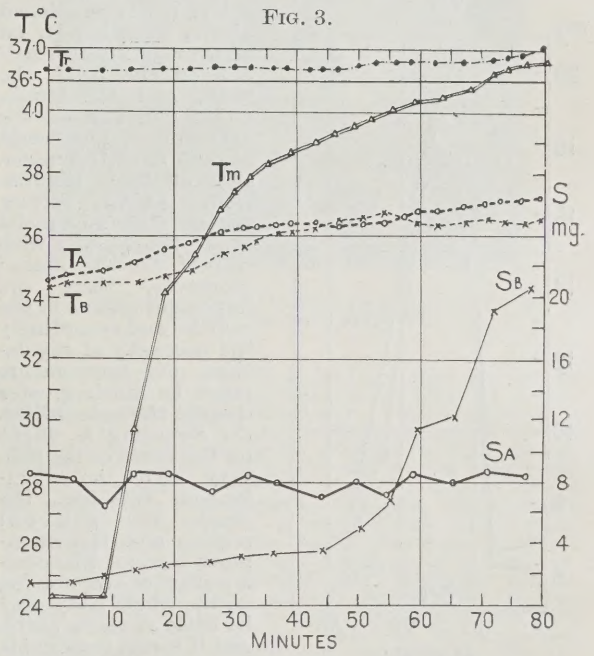
Sweating caused by local heating.

to common thermal causes, they are able to increase the secretion as a result of many other causal agents. For example, local heating applied to any part of the skin surface, if only it is of an extreme degree, can provoke profuse sweating on the palms and the soles. Besides this, we have also occasionally found that some kinds of pain or some unusual feelings, such as desire to urinate or application of Esmarch's bandage, may be the cause of this sweating. Any intense sensory stimulation seems, therefore, to be able to provoke sweating at these parts.

The most adequate cause for this sweating seems, however, to be mental stress. In our experiments mental arithmetic was used to cause mental stress; its influences on the perspiration on different parts of the body surface were observed and very interesting results obtained. Mental arithmetic caused sweating on the palms and the soles only, and not on other parts of the body surface. This is illustrated in Fig. 4 which shows an experiment of the measurement of the perspiration on both palms. During a period of time indicated by M, mental arithmetic was done. Immediately after the beginning of the mental arithmetic the amount of perspiration started to augment; it increased progressively and diminished soon after the mental arithmetic ended. Changes in the amount of sweat on one palm closely paralleled those on the other. Many other similar experiments proved that sweating on the palms and the soles due to any cause is never restricted to one of them but always appears on all four parts. Fig. 5 shows an example of the simultaneous measurement on the palm and on some other part of the skin, in this case the forehead. Tracings show that the palm sweats considerably from mental arithmetic but that no vestige of sweating is found on the forehead. The forehead is well known to be a part of the skin where profuse sweating sometimes occurs in mental stress. This experiment proves that mental arithmetic is not strong enough to cause sweating on this part, but quite sufficient to do so on the palm. All these accounts and many other similar experiments show clearly that the palms and the soles sweat extremely easily as a result of mental stress. A phrase commonly used in the Japanese language is "with sweat in the clenched hands," by which is meant "with suppressed excitement" or "with breathless interest."

With respect to the causation of sweating as well as to the distribution on the body surface, the human sweat glands are, therefore, to be classified clearly into two groups: (1) The sweat glands present on the palms and the soles have the characteristic of permanent secretion† and react with an increased secretion to mental or sensory stimulation but not to rise of temperature in the environment. (2) The sweat glands distributed all over the remaining parts of the body surface show little or none of this permanent secretion or "insensible perspiration." They are not responsive to moderate mental stimulation, but profuse sweating occurs from them when the temperature of the environment rises. One phenomenon is, however, common to these two different sets of sweat glands—i.e., every sweating, whenever it occurs, appears universally over its own respective district and is never confined to any single part in its area. For brevity I will designate the sweating from the former set of sweat glands as "mental or

FIG. 3.



Sweating on the palm and the chest under high room temperature.

psychical sweating," and that from the latter as "thermal sweating."

Physiological Significance of Sweating.

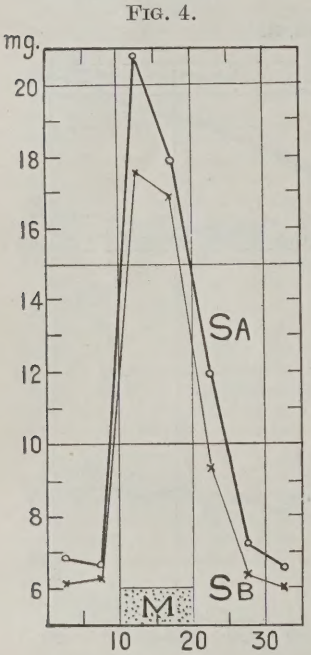
Now arises the question: what is the physiological significance of these two different sweatings? The regional relationship of the thermal sweating on the body surface was observed in the following way. Twenty pieces of filter paper, of exactly the same size and previously weighed, were attached to different parts of the skin, all over the body surface, and hermetically covered with celluloid dishes. The subject was then allowed to sweat profusely in a hot room. Afterwards the papers were taken and again weighed and the gain in weight of each paper was compared. This experiment was made on four men and four women and conformable results were

† Stated in previous papers from this laboratory.

obtained in all. The palm and the sole do not enter into the present discussion, as they are the parts where no thermal sweating appears. With the exception of these two parts, the armpit and the internal femoral region are the parts which sweat least. Generally speaking, the head, the neck, some areas of the anterior and posterior surface of the trunk, and the dorsal region of the hand sweat most. Compared with these parts, sweating on the lateral surface of the trunk and on the greater part of the extremities is remarkably slight.

In addition to this experiment, a simple investigation of sweating was made on the whole body surface on a number of subjects, and we came to the conclusion that the regional distribution of sweating accords closely with the varying necessity of heat elimination from different parts of the body. The following are the reasons for this conclusion: (1) Parts of the skin which have little chance for evaporation of heat sweat least as a rule—e.g., the armpit, the perineal region, the inguinal region, and the internal femoral region. This seems at a glance to be contrary to our daily experiences, because the parts of the skin just mentioned are the very parts which are apt to become wet in hot weather. Experiments have, however, proved that they become wet, not because the sweating is abundant, but because the sweat once discharged evaporates with difficulty. (2) As mentioned above, sweating is, on an average, most abundant on the head, the neck, and the trunk, and much less on the extremities. This seems also to meet the necessity of heat elimination. In the former parts the superficial area is small with respect to the mass; moreover, there are important organs in the cavities and accordingly the necessity of regulation of temperature must be much greater than in the extremities. (3) Sweating is slight on the parts of the skin very rich in subcutaneous fat—e.g., the cheek, the gluteal region, and the mammary region. The cooling effect of evaporation on the whole body may be little at these parts, and it seems reasonable to avoid sweating there. All these circumstances are, therefore, advantageous for the elimination of heat, and the theory that the function of sweating is the regulation of the body temperature seems quite correct for thermal sweating.

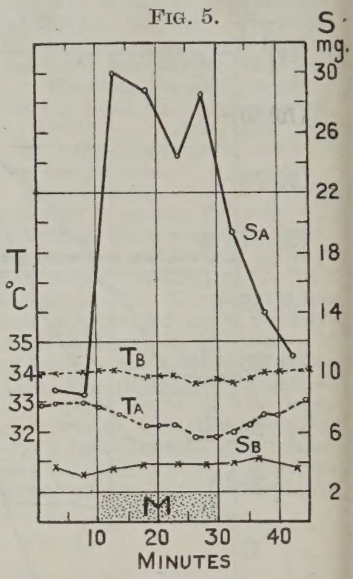
FIG. 4.



Sweating on both palms caused by mental arithmetic.

For mental sweating, however, the theory no longer holds good, because this sweating never appears on exposure of the body to high atmospheric temperature. If this sweating has any physiological significance, it may conceivably be in some relation to mental stress which is its most adequate cause. We have a peculiar habit of moistening the palms of the hands with saliva when muscular exercise is undertaken. This seems to be a habit common to the human race, physiological and not ethnological in origin, because an expression for "spitting on the hands" is found in many different languages. Moistening the surface of the palm would increase the friction between it and the objects with which it comes into contact. Consequently, every sort of muscular work would be facilitated, not only for this physical reason but also for the physiological reason that the sense of touch becomes acute when friction increases. In human beings mental stress is not necessarily accompanied by muscular work, but it is almost inevitably so in animals, because they become excited only for such reasons as self-defence against enemies and battle for the acquisition of food or for the other sex, when more or less muscular exercise is required. It is, therefore, a great advantage for animals that the pads of their feet should become wet through sweating as soon as they are excited. The sweating on the human palms and soles may be regarded as a phenomenon transmitted from animal life. Even in human beings it is not always useless. It is interesting to note that in some languages—e.g., Japanese and Chinese, perhaps in English too—the expression "spitting on the hands" conveys an implication of general physical and mental stress. It is, therefore, highly probable that this sweating has the function of facilitating physical work.

FIG. 5.



Effect of mental arithmetic on the perspiration of the palm (SA) and that of the forehead (SB).

The regional differences of sweating were also investigated on the surface of the palm and the sole by means of the method suggested by Eijkmann. The skin surface was well coloured with an alcoholic solution of fuchsin. A piece of thin Japanese paper was laid on it and kept in good contact with the skin, and then mental arithmetic was given. Drops of sweat discharged from the orifices of the sweat glands dissolve some of the dye and leave red spots on the paper. The density of these imprints corresponds to the distribution of the sweat glands in action, and the degree of colouring is roughly proportional to the amount of sweat discharged. By this method it was found that sweating is, in general, profuse on the parts of the palm and the sole which are protuberant and likely to touch objects on grasping or on walking, and much less on the remaining parts. This regional difference is especially striking between the plantar arch and the remaining parts of the sole, so that the former remains almost white while the latter becomes diffusely red. All these circumstances support the view discussed above about the significance of this sweating.

Sweating in Animals.

The degree of sweating on the pads of the feet varies extremely in different mammals, and this difference seems to be related to their habits. Presumably moistening the pads is not very necessary for animals walking on the ground only, but would be of vital importance to those accustomed to climb trees. It is well known that the pads can sweat freely in the cat and the monkey, and little in the dog and rabbit. The horse sweats most easily on the whole body surface, but the plantar regions of the extremities do not touch the ground, and sweating is not profuse on them. On the contrary, the cat sweats on the pads only and little or practically not at all on the other parts of the body. Therefore, so far as these animals are concerned, the significance of sweating on the pads seems to be the same as that of

mental sweating in man. I am anxious to know if this also applies to other animals, but our present knowledge is too limited to enable us to answer this question.

Many experiments have been performed on the cat from olden times, and the conclusions obtained from the results of these experiments play an essential part in the present knowledge of thermal sweating in man. All these experiments were, however, made under the premiss that sweating in man and in the cat are of the same nature. According to the above discussion, the sweating in the cat seems to be classified with mental sweating, and, if so, this premiss cannot be acknowledged. Judging from commonsense, too, sweating on such small portions as the pads can hardly be regarded as effective for the regulation of the body temperature.

Under ordinary circumstances, the amount of water discharged from the palms and the soles per unit of area is five to ten times as much as that discharged from most of the other parts of the body surface, and this seems to be chiefly due to a permanent secretion of the sweat glands. It has experimentally been proved in this laboratory that the diffusion of moisture through the epidermis is very slow. The outer surface of a thick horny epidermis like that of the palm and the sole might clearly become extremely dry and lose its characteristic flexibility if there were no process for supplying it with moisture. The permanent secretion of sweat on the palm and the sole is intended to meet this necessity. As a matter of fact, the epidermis of these parts sometimes becomes stone-hard on account of the thickening of the skin in a corn, or becomes chapped with dryness in cold weather, probably due to an enormous decrease in the permanent secretion owing to the effect of cold. The constant secretion of the sweat glands of the palms and the soles is, therefore, an important process for the protection of the skin.

Conclusions.

The sweat glands of human beings have three important functions: (1) the regulation of the body temperature; (2) the facilitation of physical work; and (3) the protection of the skin.

A CASE OF CONGENITAL RHABDOMYOMA OF THE HEART.

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AND
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Rhabdomyomata are rare tumours, but the heart is one of the commoner sites of occurrence. Solitary growths are rarer than multiple. Uehlinger,[3] in 1925, collected 37 cases, 7 solitary and 30 multiple, almost all from German literature. Of these, 25 occurred in the first three years of life and 31 within the first ten years. Tuberous sclerosis in the brain and renal tumours, frequent in the case of the multiple tumours (tuberous sclerosis in 21 of 30 cases, renal tumours in 12 of 30 cases), are not described in the seven cases with solitary nodules, although the brain was not always examined.

The following case occurred in our experience recently.

The patient, a male infant aged 3 months, was brought to hospital on August 8th, 1929. Whilst having his evening feed, he was accidentally struck on the left ankle by the buckle of a strap with which his elder brother, a child of about 4 years of age, was playing. The blow was only a slight, glancing one, just sufficient to cause a superficial scratch about one inch long, but the infant, not unnaturally, immediately commenced to cry vigorously. This crying bout lasted for a few minutes, when there was a sudden change, and the child became very pale and ceased crying. The change was so sinister that the mother wrapped him up in a shawl and at once rushed him off to hospital, where he was found to be dead. During the interval between leaving home and examination at the hospital—possibly some five minutes—the child remained quiet, showed no sign of life, and was presumably already dead. At no time during the attack did he appear to have any respiratory difficulty, and there was no evidence of cyanosis.

The child had always been regarded as healthy and normal. He had never suffered from fits or convulsions, and there was certainly nothing to suggest that he was other than what he appeared to be, a normal healthy child in every respect.

Post-mortem Examination.

The body was well-developed and well-nourished. No organ save the heart showed any significant alteration. In particular, no sclerosis or other alteration was found in the brain, and no tumour nodules in the kidneys or elsewhere. The heart was very much enlarged, weighing 130 g. as against a weight of about 25 g. for the normal heart at the same age. The chief enlargement, as the heart lay in situ, was to the left and slightly downwards. Further examination showed a large ovoid tumour in the lateral wall of the left ventricle, displacing the cardiac chambers to the right and upwards. The cavity of the left ventricle was dilated, but not to a marked degree. The tumour comprised by far the greater bulk and weight of the heart, and measured 3 in. by 2¼ in. on section. It was firm, pale, almost white and fibrous-looking, and the cut surface showed distinct, coarse fasciculation throughout. A thinned-out but complete layer of ventricular muscle intervened between the tumour and both endocardial and epicardial surfaces, but this was so thin that the pallor of the underlying tumour tissue could be seen from both surfaces, especially the epicardial. Although clearly demarcated from the cardiac muscle, the tumour had no definite capsule and its contour was slightly irregular. The gross appearance was very like that of a fibroma.

Fig. 1. Fig. 2.

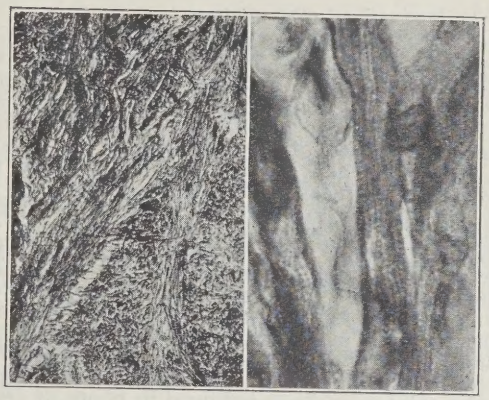

Fig. 1.—Cardiac tumour showing fasciculation. (× 50.)
Fig. 2.—The same. (× 900.)

Microscopic Examination.

The tumour was composed throughout of interlacing bundles, some seen in cross section, others in tangential or intermediate planes of section. (Fig. 1.) Each bundle was composed of striated muscle of the cardiac type, and within the bundle each small group of muscle-fibres was separated from its neighbours by numerous coarse interlacing fibres of collagenous connective tissue. Most of the connective tissue fibres ran in the same direction as the muscle-fibres of the bundle, but a considerable number branched off to run obliquely across the muscle-fibres and interlace with neighbouring longitudinal fibres of connective tissue. Thus each bundle was composed of muscle-fibres and connective tissue running in the same direction, but with the fibres of the latter also anastomosing across the intervening muscle and so bracing the whole bundle together. The greater actual bulk was connective tissue. To this, however, very few indeed of the nuclei present were related, and such fibroblastic nuclei, small, elongated, narrow, and darkly staining, were easily differentiated from the others. The remaining nuclei were all muscle nuclei, most of them well-differentiated and closely

resembling the adult cardiac muscle-cell nucleus. A minority were undifferentiated myoblastic nuclei. The fibres in which the muscle nuclei lay showed in most cases distinct regular cross and longitudinal striation (iron hæmatoxylin; phosphotungstic acid hæmatoxylin; hæmalum and picrofuchsin). (Fig. 2.) It was sometimes possible to identify alternate light and dark bands of cross striation. Here and there, however, small specially cellular areas were encountered. It was mainly in such areas that the nuclei were larger, sometimes much larger, oval or rounded, and evidently myoblastic. The cytoplasm was of irregular form and extent, being sometimes syncytial and vacuolated. It stained as did the cytoplasm of the obvious muscle with the various stains used, but only here and there did it show limited patches of regular striation. Elsewhere it was clear, or contained granules staining similarly to the constituent granules of the regular cross striations, but either completely without arrangement or forming irregular and incomplete lines of dots.

The vessels of the tumour were well-formed. No other types of tissue were discoverable in it. There was no appreciable difference between the appearance at the centre and that at the periphery of the tumour, and the ratio of muscle to connective tissue appeared roughly uniform throughout.

Commentary.

With the presence of this tumour in the heart the child was living on the edge of a precipice, and any sudden exertion or strain would be sufficient to bring about a catastrophe. Nearly all the cases reported by Uehlinger [3] occurred in children, probably because the patient is seldom spared until adult life. However, the case reported by Bradley and Maxwell,[1] a primary rhabdomyosarcoma of the heart, occurred in an adult, 62 years of age. As it happened, the precipitating factor in this case was the bout of crying, brought on by the slight injury received. The extra strain put on the heart, with the increase in blood pressure, was enough to overtax an organ already burdened by the presence of this neoplasm. It is interesting to note that at no time previously had the neoplasm given any signs of its presence, although it is not unreasonable to suppose that the child must have indulged in bouts of crying equally as vigorous as this one during its three months of life. None of the signs referable to the heart which have been reported in neoplasms of the heart (Perlstein [2])—e.g., œdema, cyanosis, hæmoptysis, or ascites—were present in this case.

While the naked-eye fibrous texture of this tumour was explained on microscopic examination by the presence of an abundance of connective tissue, it was also evident that the connective tissue was not the active cellular element but was rather an abundant framework supporting the essential element of striated muscle. This muscle, while for the most part well differentiated, was here and there myoblastic, and the conclusion that the tumour is a solitary congenital rhabdomyoma of the heart seems irresistible.

In two respects, however, the structure described differs rather strikingly from the usual description of rhabdomyomata of the heart.

1. The structure usually found is more myoblastic and less differentiated than that seen here. There is also a much more extensive vacuolation and an even greater cellularity. This striking vacuolation has been described as invariable (Wolbach [4] and others). While single oil-immersion fields can be found in the present tumour presenting in parts the usual myoblastic and vacuolated appearances, they are few and far between.

2. Accompanying connective tissue seems to be more abundant here than ordinarily, and the tumour is therefore firmer and paler than is usually found.

We wish to tender our acknowledgments to Mr. W. Nelson for taking the microphotographs here reproduced.

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Clinical and Laboratory Notes.

A CASE OF MULTIPLE CONGENITAL SKELETAL DEFORMITIES

CAUSING CONGENITAL SCOLIOSIS.

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CASES of congenital scoliosis occur in otherwise normal infants, and are due to maldevelopment of the vertebræ or of the ribs, and are associated with elevation of the scapula, outgrowing hip and changes in the lateral thoracic wall. The following is a brief description of such a case.

A girl, aged 6, was noticed to have a mole on her back at birth, which was normal, and six months later her mother observed that her back was crooked. This condition was treated by a leather jacket worn during the day. She is a bright intelligent active child, with a marked scoliosis in the thoracic region, the convexity being towards the left, the greatest deviation from the normal being at the level of the sixth thoracic vertebra, where there is a spina bifida occulta associated with a hairy mole (Fig. 1). There is compensatory scoliosis in the lumbar and to a minor degree in the cervical regions, and marked kyphosis at the level of the ninth and tenth thoracic vertebræ with compensatory lordosis in the lumbar region. Marked posterior bulging of the ribs is evident on the right side with but little compensatory bulging of the left rib anteriorly, while the left side of the chest is half an inch larger in circumference than the right at the level of the angle of the scapula. There is very little movement in the thoracic vertebræ, even when the patient is suspended by her arms from a horizontal bar, but full movement is possible in the lumbar and cervical regions.

The head is held with about five degrees lateral flexion; there are no ocular symptoms. A loose fold of skin stretches from a point posteriorly to the right mastoid process to the right acromion process. The right shoulder is held at a higher level than the left, the right scapula being rotated so that the angle lies only half an inch from the spinous processes as compared with a distance of two and a half inches on the left side.

FIG. 1.

Photograph showing site of spina bifida occulta and hairy mole.

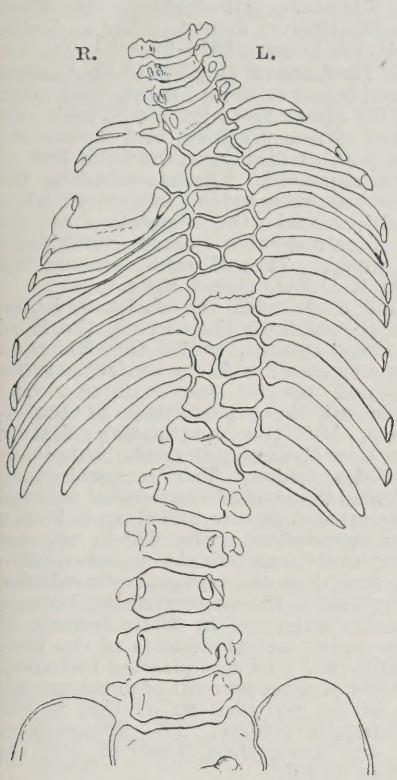
The pelvis is very slightly tilted, the left gluteal fold being slightly higher than the right, and being more marked. The only difference in the legs is a slight genu valgum on the left side. A pelvic examination has not been made.

X ray examination shows the causes of the scoliosis which is due to non-fusion of the lateral halves of the body of the second thoracic vertebra, the right half being displaced laterally and articulating with the second rib, which after fusion with the third rib for a short distance becomes bifid at the angle, and also to suppression of the right half of the eleventh thoracic vertebra. There is also non-union of the lateral halves of the sixth thoracic vertebra—the site of the spina bifida occulta—and of the ninth and tenth thoracic vertebræ. The eleventh and twelfth ribs are absent on the right side. A tracing from the radiogram is shown in Fig. 2. A plaster jacket has been made for the patient to lie in whilst at rest, in order to check the increasing deformity and in the hope of partially correcting it by inserting suitable padding. A leather spinal support is worn during the day. She has been given massage for the fold of skin of the neck and scoliosis exercises, but it

is doubtful if the latter will have any beneficial effect on the deformity.

The striking features of the case are the number of errors of maldevelopment which occur in the thoracic area—the cervical and lumbar areas being normal except for the compensatory curves—and the unusual position of the spina bifida occulta. This case emphasises the importance of X ray examination in all cases of scoliosis in young children in order to discover the causes of the condition, which may be due to supernumerary deficient or fused half vertebræ, or synostosis of the ribs, all arising out of the maldevelopment of the skeletal axial skeleton, and in order to prevent the increase of the deformity during the active days of childhood.

FIG. 2.



Tracing from radiogram.

I am indebted to Mr. C. P. G. Wakeley, under whose care this case was treated at the Belgrave Hospital for Children, for permission to publish these notes.

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A NEW TREATMENT FOR ARTERIAL CALCIFICATION.

BY DR. VLAD. MLADEJOWSKY,
PROFESSOR AND CHIEF OF THE INSTITUTE OF BALNEOLOGY AND PHYSICAL THERAPY, KARL UNIVERSITY, PRAGUE.

THE usual routine treatment and therapy for arterio-sclerotic patients always seemed to me so inadequate that I have employed a course of treatment not generally known which has proved so successful that I am desirous of placing this communication before my British confrères. Arterio-sclerosis is a physiological accompanimest of old age and may be hereditary. The commonest causes are mental excitement and a diet too rich in proteins, combined with insufficient physical exercise, especially in middle age. Contributory causes are nicotine, alcohol, and infections. Severe physical exertion with an insufficiently nutritive diet may lead to the same result. Where there is deficient toxin elimination by the intestines and skin the kidneys become overburdened and nephrosclerosis may occur. The well-known changes in the intima and media of the arteries cannot account for the whole of the clinical picture. Many authors report that certain drugs, such as iodine and silica, mitigate the troublesome subjective symptoms (vertigo, headaches, insomnia, angina pectoris), but the same auscultatory signs remain. This coincides with my own experience. All these symptoms cannot be wholly due to high blood pressure, for they frequently disappear before the blood pressure has decreased, which proves that the pathologico-anatomical changes detectable by auscultation and frequently by X rays may exist without any subjective disturbances and that there must be other causes which require special remedial treatment.

It is probably correct to regard certain symptoms of arterio-sclerosis as splanchnic crises due to calcification of the nutritive vessels. If the demands on it are moderate the blood stream flowing through the narrowed arteries suffices, but otherwise its insufficiency causes crises. The clinical picture is obviously highly complicated, presenting many points of attack for therapy, and though there is little hope that the anatomically changed arteries will return to normal conditions there are prophylactic possibilities and the probability of retarding progress and of rendering the patient's condition endurable.

The skin of arterio-sclerotics, particularly the skin of the face and extremities, supplies an index to many of the symptoms. The extremities are cold and livid as a result of derangement of the heat regulation, while the hue of the nose is typical of the aged face, small arteries show on the nasal alæ and cheeks, and the skin becomes inelastic, furrowed, and dry. Another type, most frequently occurring in the obese and usually of very long standing, is the markedly pale, pasty, dry skin. These individuals may be subject to the same disturbances of heat regulation as the first type and attacks of cardiac spasm are frequently ushered in by the appearance of redness in Head's "cardiac region." All these symptoms are, no doubt, due to the same causes as the arterial calcification and partly to disturbances of internal secretion.

By an extensive series of tests made in the department of balneology and physical therapy at Prague University we were able to demonstrate that after thermal and mechanical (and also electro-therapeutic) treatment, blood pressure was raised very temporarily and by no more than the ordinary daily variations, and fell again when the skin reaction set in. There is no danger in the increase of blood pressure as is proved by our treatment of several thousand cases of arterial calcification, without a single hæmorrhage. The skin as well as the arterial calcification can be influenced hydropathically. The patient must react normally, and if he fails to do so the process must immediately be modified to suit his condition. The heat regulation usually improves after this treatment. It is possible by certain procedures to provoke hyperæmia or anæmia of the skin and the general circulation and thus the heart will be greatly relieved. This is often of more value than cardiac and vascular medication. Hydrotherapy is also capable of affecting the internal organs via the skin. The method described forms the basis of the treatment and can be altered to meet individual cases.

Technique.

The patient is well brushed in a warm (35°–36° C.) half bath for 10–20 minutes and then receives a good douching with a fan-shaped douche from a distanceof 6–7 ft., at first for two to three minutes with water at 35° C., then with water at 25° C. for one to two minutes. These douches are repeated two or three times. At first they are usually applied to the back and lower extremities and later over the whole body. The patient is thoroughly dried, well wrapped up, and then allowed to lie down for at least half an hour.

Some patients react badly to the heart stimulation; it deranges the body heat regulation; they tend to shiver; the isothermic water seems cold, and after the procedure they cannot regain warmth; and skin reaction does not take place. For these we begin with half baths, usually at 38° C. for not more than 10 minutes; the brushing must be energetic. We decided on 38°–40° C. for the douches, after which the patient must be well rubbed until the skin becomes red and the feeling of cold vanishes.

Should the patient be very delicate or suffer from hypotension, myocarditis, or cardiac debility, artificial sunlight

is applied instead of the baths, and we only resort to hydrotherapy when the condition has improved.

This treatment has given highly beneficial results in several thousand cases. The subjective symptoms disappear, the blood pressure decreases, and the skin assumes its normal appearance. The auscultatory symptoms and X ray picture, however, mostly remain unchanged. Painful sensations in the cardiac region are treated by anionisation. If the patient suffers from spasms we bring into use the "tonisator," an apparatus devised by Dr. Ebel of Vienna by which a faradic current is varied in intensity and frequency by means of a clockwork mechanism without producing any discomfort.

Drug Treatment.

Silica has long been used in French therapy and a beneficial effect on arterial calcification claimed in cases of tuberculosis. Intravenous injection brings with it the danger that some of the solution may find its way into the cellular tissues and set up painful reaction. I therefore determined to try silica given by the mouth in colloidal form. Many authors assert that silica deficiency in the organism is due to bad intestinal resorption. To prove this I decided to combine the silica with an extract of *Drosera*—the common *Drosera rotundifolia*. Modern pharmacology gives us little information about this plant, but since it is an insectivorous plant it must contain ferments which not only digest proteins but also chitin. The researches of Stocklasa have shown that the ferment of the *Drosera* is a far more efficient proteolytic agent than pepsin; and that *Drosera* possesses a keratolytic ferment and an iodoxydase. The extract had therefore to be prepared in such a manner that all the ferments remained intact. For convenience of administration the drugs were prepared in tablet form under the name of "Drosil." I found that its action was surprisingly efficient in overcoming the subjective troubles of arterio-sclerosis (vertigo, confusion, insomnia, cardiac oppression) and in the alleviation of the symptoms of cardiac debility such as dyspnœa, articular œdema, and hypostasis. In cases of hypertonia a slow but lasting improvement took place. Two of the tablets are taken thrice daily; they may be dissolved in hot water. The treatment lasts for four or five weeks and during this period the patient's condition usually shows a marked improvement. An interval should follow until the old symptoms reappear; this interval may last for weeks or months.

It is advisable to combine this therapy with hydrotherapy and then to continue the hydrotherapy. The diet should be light with little protein. Open-air exercise is helpful. It may be that the *Drosera* ferments assist the adsorption of the silica and so supply the silica deficiency in the organism—a substitution therapy. There is also a possibility that the silica which is resorbed in a form convenient to the organism may act as a catalyst, effective as a remedy for harmful effects, and at the same time as a retardive of colloidal changes. It is valuable for the musculature and especially the heart muscle. Stocklasa recently discovered a lipolytic ferment in the *Drosera*, and I am experimenting with this and with a combination of silica, *Drosera*, and extracts of the thyroid and sexual glands.

SHROPSHIRE ORTHOPÆDIC HOSPITAL.—Last year this institution treated a total of 4720 patients and, after spending £48,541, had a credit balance of £30. The hospital, which is at Oswestry, has 33 clinics scattered over eight counties. A cinema has been installed, and films are shown on two nights a week to the patients and on another to the staff and those who are being trained at the Derwen Cripples' Training College, which is close to the hospital. The after-care scheme now embraces an almost equal proportion of preventive work. The temporary buildings erected 16 years ago are very costly to keep in repair, and it is proposed to begin the work of reconstruction by providing a new nurses' home.

Reviews and Notices of Books.

ANATOMY.

Lehrbuch der Systematischen Anatomie. By Prof. Dr. JULIUS TANDLER, Director of the First Anatomical Institute, Vienna. Vols. I.–IV. Leipzig: F. C. W. Vogel. 1926–29.

IN 1912 Prof. Tandler, of the First Anatomical Institute in Vienna, began to write his magnum opus, but the war and its after-effects interfered with this work as with that of many others, and it was not before the latter part of last year that the last of his four volumes appeared. The standing of the author, and his unimpeachable authority when writing on his subject, make the completion of this work a matter of considerable interest throughout the anatomical world. It will rank among the leading text-books in the German tongue.

The first volume deals with the skeleton, joints, and muscles, the second with the viscera, the third with the circulatory system, while the last and largest volume is concerned with the central nervous system, nerves, and special sense organs. The accounts given of all these parts are, of course, full and accurate, but the outstanding feature which impresses one throughout is the simplicity and clearness of description. This is particularly apparent in the consideration of the central nervous system, where the mental picture called up is hardly bettered in any text-book with which we are acquainted. The almost complete absence of embryological reference, except as the necessary foundation of the nervous system, is the more striking because of Prof. Tandler's eminence in that branch of anatomy. In the earlier advertisements of the book it was stated that a final part was planned including, among other matters, a short account of development, but the author makes no mention of this in the foreword to his fourth volume. The illustrations, of which there are more than 1200 in all, are beautiful as well as useful.

Prof. Tandler deserves the congratulations as well as the thanks of his colleagues in all countries for this great book, which is weighty without being heavy, and is stamped with his personality in a way which distinguishes it from the compilations which now form the basis of many modern text-books.

A Text-book of Anatomy and Physiology. Third edition. By JESSE F. WILLIAMS, M.D., Professor of Physical Education, Teachers College, Columbia University, New York City. London: W. B. Saunders Company. 1929. Pp. 578. 12*s.* 6*d.*

THIS book, evidently in demand, is intended for students of the practical arts—to use its author's words—such arts comprising nursing, physical education, physiotherapy, occupational therapy, and household crafts. We imagine that it is rather intended as an aid and stimulus to the teacher than for the immediate study of the students themselves, but in any case it is one of the best books of its kind that we have seen. This edition has been revised in many ways, and a large glossary has been added. There is not, perhaps, the same demand for books of this class in England. It is not full enough, of course, for students of medicine as their only text-book, but many of these students would learn a good deal if they studied it after they have done their intermediate courses. It is very well illustrated and produced.

PATHFINDERS IN MEDICINE.

Second edition. By VICTOR ROBINSON, M.D. New York: Medical Life Press. 1929. Pp. 810. $10.0.

Dr. Victor Robinson, in this second edition of his work, has much increased both its scope and value. The volume now consists of a series of 30 essays

written during the past 20 years, which have been published separately in various appropriate journals or have found their way into the archives of medical societies, and their collation adds to their individual merits and makes up a useful book of reference. The pathfinders, whose work as pioneers in medicine is described, are as follows: Galen, Aretæus, *Rhazes, Paracelsus, Servetus, *Vesalius, Paré, *Descartes, *Malpighi, John Hunter, Edward Jenner, Henry Cavendish, Scheele, Berzelius, *S. Guthrie, Laennec, *Purkinje, Schleiden-Schwann, *Henle, Darwin, J. Y. Simpson, *Duchenne, *Bernard, *Hebra, Semmelweis, *Elizabeth Blackwell, *Pasteur, *Koch, *Metchnikoff, and *Pavloff. The names in this distinctly capricious list which are marked with an asterisk are the pathfinders whose lives comprised the first edition of the book, the remaining 15 names denote the subjects added for the purpose of this issue. All the essays are written in an extremely readable fashion, many of them are adequately illustrated, and the material often owes both its detail and its accuracy to the assiduous manner in which Dr. Robinson has approached relatives, descendants, and recognised authorities for information and criticism. This is particularly obvious in the longest article, that devoted to the life of Henle; it includes four portraits of Henle himself and portraits of his wife, mother, sister, and daughter, and several facsimiles of his handwriting. The chapter would make a small book in itself and will be read with interest by those who know no German, for Henle is not frequently brought to the attention of English readers.

This is a handy work of reference and in many cases the biographies, though individually brief, will be found to need little supplement in essentials from larger lives of the various pathfinders.

BIRTH CONTROL ON TRIAL.

By LELLA SECOR FLORENCE. Foreword by Sir HUMPHRY ROLLESTON, Bt., K.C.B. Introduction by F. H. A. MARSHALL, F.R.S. London: George Allen and Unwin, Ltd. 1930. Pp. 160. 5*s*.

THIS book provides a detailed and disinterested survey of contemporary contraceptive methods. Mrs. Florence has followed up, with a scrupulous perseverance that deserves much praise, the first 300 women who attended the Cambridge Women's Welfare Centre for advice on birth control. Of these 300 patients, Mrs. Florence failed to trace only 25. A further 28, for one reason or another, were never given advice on birth control. Records are therefore available of 247 women. Of these women, 75 found that the contraceptive method taught them failed in one way or another. Three of this number experienced two successive failures, with the result that 78 pregnancies resulted. Another 80 patients for various reasons gave up the method that they had been instructed to use at the clinic. Out of 247 patients, therefore, no less than 155 found that the pessary or the sheath was unsatisfactory. These cases are analysed with some care in the book, which should prove of great value to medical men who want an impartial account of the efficacy and practicability of the various methods of birth prevention.

Of the many interesting points brought out by the survey, three deserve notice. The first is that the experience of the Cambridge clinic caused the medical officers to place more and more reliance on the sheath as the most dependable method for those couples who do not find it æsthetically objectionable and in which the husband can be relied upon to use it. The sheath has received an undue amount of condemnation by writers on contraception. The Cambridge clinic uses with success an article that costs sixpence. These are frequently employed for three or four months, and a case is on record of a man who used his without mishap for three years consecutively. A second point which the author frequently stresses throughout the book is the need for further research. From the chapter dealing with successful cases, it is obvious that the clinic in Cambridge performs a highly valuable function. To argue from the high proportion of failures that this clinic, and the other birth control clinics, are useless would reveal a lack of understanding of the needs of working-class women, many of whom are grateful for knowledge which, if it fails to prevent childbirth, at any rate enables them to prolong the intervals between childbirths. The imperfections of existing methods should move us not to despair, but to seek to find better methods. A third point that deserves notice is the prevalence and unreliability of coitus interruptus. Of 265 patients, 118 had practised this method before coming to the clinic, and in these cases it had failed to the extent that there resulted no less than 409 unwanted pregnancies.

Though the numbers on which this study is based are small, the follow-up has been unusually thorough. The author writes with an impartiality and restraint unusual among advocates of birth control.

INFECTIOUS DISEASES.

Acute Infectious Diseases. A Handbook for Practitioners and Students. Second edition, revised and enlarged. By J. D. ROLLESTON, M.D. Oxf., M.R.C.P. Lond., Medical Superintendent, Western Hospital, S.W. London: William Heinemann (Medical Books), Ltd. 1929. Pp. 419. 15*s*.

THE first edition of this excellent book which appeared over four and a half years ago was based on the author's personal experience and on a study of the literature of the commoner acute infectious diseases. In this second edition new work has been incorporated, the principal additions and alterations being in the chapters on diphtheria, typhoid fever, scarlet fever, measles, and vaccinia. References to the literature of the various diseases has been brought well up to date. Immunisation against diphtheria and scarlet fever, and also the attempts to immunise young children against measles, by means of convalescent serum and whole blood, including virulent whole blood, are well described. The measles problem is undoubtedly a difficult one in large cities where hospital accommodation is inadequate; immunisation may well help to reduce the high mortality from measles associated with overcrowding in congested slum areas. Since patients suffering from influenza, puerperal fever, anterior poliomyelitis, and encephalitis lethargica are nowadays admitted to many fever hospitals, chapters on these diseases might usefully have been added. Dr. Rolleston's views on treatment are of interest. Many physicians still adopt the practice of giving alcoholic stimulants in acute infectious fevers. Dr. Rolleston gave up this practice many years ago, and holds that there is no justification for the routine administration of alcohol even in diphtheria. No illustrations are provided. The average student undoubtedly learns much from good pictures of rashes, while even temperature charts help him to remember the characteristic course of the various exanthemata. Practitioners who have already a working knowledge of the infectious diseases need neither of these aids, and will find here just what they require, as well as numerous references to original communications.

Infectious Diseases for Nurses. By EUSTACE THORP, M.B., Ch.B., D.P.H., Deputy Medical Officer of Health, Sunderland. London: Baillière, Tindall and Cox. 1929. Pp. 131. 5*s*.

THIS little book is primarily designed for nurses and is based on a series of lectures to them. Dr. Thorp obviously agrees with the teaching of the best authorities on fevers, and the book contains valuable information put in familiar language. He deals with all the common infectious diseases and, in addition, provides brief chapters on such diseases as undulant fever; encephalitis lethargica; anterior poliomyelitis; tuberculosis, including tuberculous

meningitis and surgical tuberculosis, &c.; ophthalmia neonatorum; puerperal fever and venereal disease. A good account of bed isolation is included with detailed instructions for barrier nursing. Dr. Thorp divides the stages of laryngeal diphtheria in two ways, giving first quite a satisfactory classification and then a second one—which he prefers; this duplication is likely to confuse nurses. On the whole, however, this is a good book and should become popular.

GYNÆCOLOGY.

Fourth edition. By BROOKE M. ANSPACH, M.D., Professor of Gynecology, Jefferson Medical College, Philadelphia. London: J. B. Lippincott Company. 1929. Pp. 752. 42*s*.

THIS is now one of the most popular American text-books on gynæcology, having reached four editions in eight years. A certain amount of new matter has been added but no great changes have been made in this edition. Unlike the authors of most recent American text-books, Prof. Anspach does not dismiss the radical operation for carcinoma of the cervix as an obsolete operation. It is described in detail, though it is definitely held to be inferior to radium in the treatment of carcinoma of the cervix. It is curious that the results obtained with radium at such centres as Stockholm and Paris are not mentioned even among the references to original publications which round off each chapter. Of particular interest are the accounts of recent work on sterility and of the uses of electricity in gynæcology.

LABORATORY METHODS OF THE UNITED STATES ARMY.

Edited by CHARLES F. CRAIG, M.D., Colonel: Medical Corps, United States Army. Philadelphia, Lea and Febiger. 1929. Pp. 696. $3.50.

THIS book is written by laboratory workers for their kind, being designed for the guidance of workers in the laboratories of the United States Army Medical Corps. It contains descriptions of all the procedures used in these laboratories, but no details about interpretation of findings; the descriptions are clear and concise, and the editor has had the good judgment to include in every instance an account of only one well-tried procedure for one particular purpose. In so doing he has made a step towards the much-needed standardisation of laboratory procedures. Being designed for an Army Service, the book deals not only with the ordinary laboratory procedures of use in general medicine, but also with the examination of water, alcohol, foodstuffs, and also of veterinary specimens. These sections will make the book particularly useful to the isolated laboratory worker, who is only occasionally called upon to deal with work of this sort.

THE SOYA BEAN AND THE NEW SOYA FLOUR.

By C. J. FERRÉE. Revised translation from the Dutch by C. J. FERRÉE and J. T. TASSAUD. London: William Heinemann (Medical Books), Ltd. 1929. Pp. 79. 6*s*.

A FULL account is here given of the Soya bean, its history, cultivation, and nutritive properties. As one reads one feels that such a nonpareil among vegetables has indeed suffered neglect for too long, but the cause of this neglect is to be found in the extreme difficulty of rendering it palatable for Western consumption. The object of the book reveals itself in the statement that this difficulty of unpalatability has been overcome by means of a secret process discovered by a Hungarian, Dr. Laszlo Berczeller. There is no doubt that the Soya bean has extraordinary nutritive properties, which if they could be applied to supplement dietaries in Europe and in Asia, particularly in British India, might convey great benefit. This book should not, however, be mistaken for a scientific manual on the subject.

ULTRA-VIOLET LIGHT AND VITAMIN D IN NUTRITION.

By KATHARINE BLUNT, President of Connecticut College; formerly Chairman of the Department of Home Economics, University of Chicago; and RUTH COWAN, Instructor in Home Economics in the University of Chicago. Chicago: University of Chicago Press. 1930. Pp. 229. 11*s*. 6*d*.

THE object of the book is to place at the disposal of those whom it should chiefly concern—i.e., physicians, dentists, teachers of nutrition, and parents—a general survey of the remarkable progress which has recently been made in our knowledge of vitamin D and ultra-violet light and their relation to the calcium and phosphorus metabolism of the body. It covers the field well and most accurately, the exposition being clear and not too technical for the first three categories of persons named, but for the average parent it would make difficult reading.

The book is naturally built up largely on Transatlantic work, and to British readers the occasional lapses into colloquial style will be unwelcome. However, fair credit is given to researches made in Europe, and in general the handbook can be warmly recommended.

JOURNALS.

INDIAN JOURNAL OF MEDICAL RESEARCH.—The issue of January, 1930, contains 34 papers covering a wide range of research work in India. T. A. Hughes and D. L. Shrivastava contribute two papers on the enlarged malarial spleen, and J. A. Sinton, S. Smith, and D. Pottinger record the therapeutic effects of plasmoquine and quinine in malaria. In a separate publication Sinton details his observations on the parosan and dimeplasmine treatment of the same disease. The dietetic deficiencies receive much attention. R. McCarrison compares the dietetic value of whole wheat and white bread; the latter is not recommended as a staple article of diet owing to its lower nutritive value and deficient content in vitamin B. Another paper by the same author deals with the effects on the tracheal mucous membrane and on the thyroid gland of food poor in vitamin A. C. Newcomb investigated the water content of the myocardium in beri-beri columbarum, and found that the enlargement of the heart was not explained by water retention. D. C. Wilson and her colleagues contribute two papers on osteomalacia (late rickets) in India, the first dealing with the blood picture and the second with ætiological considerations. A consistent lack of vitamin D and deficient sunlight were the chief factors implicated, but an excess of cereals in the diet contributed to some degree. The incidence of rickets and dental caries in school-children forms the basis of another paper. L. Wills and M. M. Mehta issue a preliminary report on pernicious anæmia of pregnancy; they found the gastric secretion of hydrochloric acid practically normal, the indirect van den Bergh readings low, and the blood picture megalocytic in type. The significance of diets poor in vitamins A and C are discussed. A. C. Ukil contribute two papers on tuberculosis in India. The first deals with its epidemiological and pathological aspects, the second with the rôle of secondary bacterial infection in phthisis. In kala-azar, L. E. Napier and C. R. Das Gupta demonstrate the value of a provocative injection of pentavalent antimony in diagnosis, while elsewhere R. B. Lloyd, L. E. Napier, and G. C. Mitra show that this disease in the absence of syphilis does not give rise to a positive Wassermann reaction. W. J. Webster and G. D. Chitre describe a simple method of rearing laboratory-bred rat fleas and also recorded the successful transmission of plague by *X. brasiliensis*. Several other important entomological contributions are made, the most striking being the demonstration by H. E. Shortt and his collaborators of the presence of *Leishmania donovani* in wild *Phlebotomus argentipes*. The issue closes with an interim report on the bacteriophage inquiry conducted under the auspices of the Indian Research Fund Association.

THE LANCET.

LONDON: SATURDAY, APRIL 26, 1930.

HOSPITAL POLICY.

A SUPPLEMENT to last week's issue of the *British Medical Journal* contains a detailed account of the revised hospital policy of the British Medical Association—that is to say, that the document provides an orderly review of the social changes in recent years as reflected generally in hospital management and conduct. Hence it makes informing reading alike for medical staffs of hospitals, private practitioners, the patients, and the public. The views of the Association with regard to hospital accommodation are set out with typical schemes for the organisation of two main types of institution—namely, the voluntary and the municipal, or those which now have come under the authority of County Councils through the recent Local Government Act. In both cases the Association is concerned especially to see that certain fundamental conditions are met, such as the limitation of hospital accommodation to those patients where medical service in the best interests of the patient can be given only in an institution, and an arrangement for the medical staffing in accordance with principles approved by the medical profession.

A further condition of right hospital policy is also indicated in the opinion given that the normal method for the admission of patients should be on the recommendation of a medical practitioner. Of recent years this right way of filling the beds has been more generally adopted, and the system by which subscribers, in recognition of their generosity, could nominate candidates for reception in crowded institutions has fallen into discredit. This system was always looked at askance by those who had the best interests of the voluntary hospitals at heart, but it was the common view of those who had the financial management of the charities in their hands that its maintenance was valuable for opening the public purse, and in deference to this business attitude it was persevered in till lately. But under the abuse of hospital letters, especially at certain of the metropolitan hospitals, the practitioner was much discouraged from sending patients for hospital treatment in those earlier stages when that treatment would have been most beneficial; and when the patient was so ill that entrance to the hospital could hardly be refused, the practitioner felt that it was the desperate need of the subject, and not any prevision of his own, that had secured, and possibly secured too late, the ministrations that were needed. This situation should no longer arise, and probably the cases that find their way into the wards in this miserable manner are now much fewer, while medical service under the National Insurance Act provides, as a part of the routine performance of the practitioner's duty, the recommendation of cases fitted in his judgment for hospital treatment to authorities who, on their side, recognise that to welcome such patients as far as possible is to give development to one of the most important implications of the Act. As we all know, the waiting-lists at most of our general hospitals are pathetically long, and the main reason for this is that a vastly larger number of persons, qualified by sickness and suffering for institutional care, are detected than was formerly the case. These persons constitute the sad crowd with which the new municipal hospitals will have to deal in part, as and when they are able to meet the responsibility, while the number of beds which we may soon see opened will enable some method of classification to be arrived at by which certain centres will be selected for the relief of particular groups of cases. Such a method should provide great opportunities for teaching, when this mine of material can be fruitfully worked through the offices of capable teachers, and in this way a further ideal can be realised—which also is emphasised in the statement of the Association—that as far as possible all hospitals should be available for purposes of medical education.

The essence of the conduct of voluntary hospitals has been the independence inherent in their management. This has been insisted upon over and over again in these columns, and the arguments have been reiterated to show that a system under which the charities manage their own affairs has worked to the advantage of the public, while fostering the advancement of medical science. It was assumed that this independence was a corollary of the fact that the benefits bestowed by the voluntary hospital were gratuitous and that the medical staffs were unpaid. An alteration in professional opinion must be recorded here, as the Association recognises when outlining a dual interpretation of the voluntary principle. The purely charitable side, it is stated, should be continued, wherein the whole cost of the maintenance of free patients is met by the gratuitous contributions received by the hospital, on whose behalf the services of the visiting medical staffs are given gratuitously; but it is added that patients, other than free patients, may be received for treatment at voluntary hospitals and that for them payment should be accepted by the hospital either from the patients themselves or, on their behalf, from the authority or body referring them to the hospital, and that on account of their treatment suitable methods of remuneration of the visiting medical staff should be arranged. This is a succinct statement of what is now a widely held professional view, but in the consequent pecuniary arrangements there are factors to be considered which will render difficult that desirable "medical staffing in accordance with principles approved by the medical profession." This is the place where the claims of the voluntary and the municipal hospitals may be opposed in a manner calling for delicate adjustment.

POLIO-ENCEPHALITIS SO CALLED.

A FEATURE of the Registrar-General's return of infectious diseases for many weeks past has been a high proportion of cases of polio-encephalitis relative to the number of cases of poliomyelitis. Three weeks ago, and again this week, the number classified as polio-encephalitis was actually higher than the number under the heading of poliomyelitis. We think it is right that these figures should be submitted to some scrutiny. Apart from certain cases in which the bulb or pons is involved, true polio-encephalitis is unquestionably a very rare disease, even at times when the poliomyelitis infection is prevalent. WICKMAN, in the great Swedish epidemic of 1905, saw no instance of polio-encephalitis; KRAUSE, in the Westphalian epidemic of 1909, saw only one case; ZAPPERT, in a collection of 555 cases of poliomyelitis, found only five cases which he regarded as polio-

encephalitis; PEABODY and DRAPER, among their own 183 cases, did not find a single typical case of polio-encephalitis; and SÖRENSEN, among nearly 100 cases in Copenhagen, saw no case which he could confidently describe as polio-encephalitis. It has been common, however, in this country, following the lead given by STRÜMPELL in Germany in 1885, to ascribe a large proportion of cases of hemiplegia in infants to encephalitis resulting from infection by the virus of poliomyelitis. These are cases in which, after a short period of malaise and pyrexia, convulsions occur and are followed by hemiplegia. The illness, like poliomyelitis, usually affects children within the first three years of life, and it is apt to occur during or shortly after one of the acute specific fevers. It is to be assumed that most of the cases included as "polio-encephalitis" in the official returns are of this nature.

These cases of infantile cerebral palsy, as was pointed out long ago by G. F. STILL, show neither the seasonal incidence nor the epidemic occurrence which are features of acute anterior poliomyelitis. Whereas in a very large proportion of the cases of the latter disease in this country the onset occurs during the autumn months, infantile hemiplegia appears to come on with equal frequency at all times of the year. Many epidemics of poliomyelitis have now occurred in different parts of the world, but no special prevalence of infantile hemiplegia has been described in association with them. A significant fact to which attention was drawn by STILL, and which has recently been proved anew by FAIRBROTHER and HURST, is that, in the experimental production of acute anterior poliomyelitis in monkeys, the intracerebral inoculation of the virus does not result in spastic paralysis of the cerebral type, but in flaccid (i.e., spinal) paralysis of the lower limbs, with the lesions of acute anterior poliomyelitis in the spinal cord. It is evident, therefore, that even in conditions which would seem especially to favour the occurrence of a cerebral paralysis the virus of poliomyelitis maintains its affinity for the spinal cord and does not produce the spastic paralysis which is seen clinically in infantile hemiplegia. There seems thus to be no sufficient ground for regarding infantile hemiplegia, coming on in association with a febrile illness, as having any close kinship with the more common spinal infantile paralysis.

At the present time there is another group of cases which is likely to swell the number of those grouped under the heading "polio-encephalitis." These are cases of encephalitis occurring in association with one of the specific fevers, such as measles, or even without any such association. Such cases of acute disseminated encephalitis seem to have been much more common during the last two or three years than formerly. The pathological changes found in the brain in these cases differ in many important particulars from those produced by the virus of poliomyelitis, and it is therefore certain that these cases are distinct from polio-encephalitis. It will be apparent that all statistics relating to polio-encephalitis must for various reasons be fallacious, and that they are likely to remain so as long as we are devoid of any specific test for recognising infection by the poliomyelitis virus. Whether any useful purpose is served by having a separate group for "polio-encephalitis" in the official returns seems doubtful. It will also be apparent that the diagnosis of polio-encephalitis is one which should be made at all times with reserve, and which, as applied to disease of the cerebral hemispheres, is hardly plausible except at times when poliomyelitis is rife.

PSYCHIATRIC REFORM.

Dr. MAPOTHER's impressions of psychiatry in America, which we published last week, are timely seeing that the Mental Treatment Bill has not yet passed through all its stages. They will shock those who think we have nothing to learn from other countries and who are satisfied that the eighteenth and early nineteenth century reforms, in which England took a large part, so settled the principles of treatment of the insane that for ever in this country its abuses and corruptions are removed. In America ample money has been available for the endowment of missionaries on mental hygiene, and the Commonwealth Fund has acted on the principle that private charity is best directed towards financing hopeful experiments, withdrawing its support when the experiments have proved so successful that the work ought to become a part of the national duty. On these terms a child-guidance clinic has recently been started in London, and the British psychiatrists appointed to it visited America to study American methods. The International Congress of Mental Hygiene to be held in Washington next month will take many of our own mental specialists across the Atlantic, and there is constant interchange of medical and lay psychological workers between the two countries for brief periods of training. The chief point that emerges from Dr. MAPOTHER'S survey is the remarkable freedom of American psychiatrists from legal interference. America has learnt to trust her experts in a way that England has not. She has also learnt to subsidise efforts to secure mental health, both from State funds and private munificence. The governor and legislature in most progressive American States are content to limit their province in the realm of mental disease to deciding how much money they can afford for new ventures. Procedure varies from State to State, but the permanent Commissioner, if a psychiatrist with institutional experience, may have powers far exceeding those of our own Board of Control and has direct access to the legislature without the intervention of any layman. In the criminal courts the psychiatrist is more widely consulted and his advice more closely followed than anything dreamt of in this country. Where the court differs from the psychiatrist, the result is almost invariably a more lenient sentence: this is an answer to those who fear that reference to a psychologist means "coddling the criminal." The commitment regulations vary with different States, and in Maryland a patient can be committed for permanent detention on the certificate of two medical practitioners without judicial intervention. The system works well; actions for illegal commitment are no commoner there than elsewhere and practically never successful.

Another direction in which advance has been made in America is in psychiatric education, both of the public and of the profession. In contrast to the scanty instruction of students which is still a reproach to medical education in this country, the American medical schools teach medical psychology and psychopathology in each of the four years of the course; the students examine mental and neurotic cases, and they learn the psychological aspect of the ordinary hospital case. America has often been accused of over-specialisation, but she is not unaware of her own risk, as is shown by the recent foundation of the Institute of Human Relations at Yale. Here the future doctor, lawyer, clergyman, and business man are to come together for a common grounding in

psycho-biology. Dr. MAPOTHER summarises the situation by saying that American psychiatry is characterised by the domination of the medical spirit and the instinct to look rather to the future than at the present. Nevertheless, there is room for doubt whether the methods adopted in the United States of America are necessarily of value here. The conditions vary so greatly; the attitude of the public is so different; and more than this, the available resources are unlike. Conditions exist in America that would not be tolerated here, even though the scientific work in certain directions is far in advance of ours. It would perhaps be unwise to think of any country as being pre-eminent in psychiatry. Dr. MAPOTHER himself is sceptical of the Mental Treatment Bill, and, as we have pointed out, certain of its tendencies appear to be unfortunate. Whether he is justified in speaking of England in this respect as a lawyer-ridden country and in extolling the States as being comparatively free from this alleged evil is a matter of opinion. Some of his illustrations of procedure strike us here as odd. The power to use a habeas corpus procedure, which resulted in a patient shooting the lawyer who was instrumental in gaining him freedom, is a case in point. Some have wondered whether as a matter of fact there is more liberty in America than in our own land. At any rate, judging from what we read, the English are naturally a more law-abiding people; this being so, our machinery for dealing with mental illness may rightly differ from that of America.

The real value of Dr. MAPOTHER'S survey, as it seems to us, lies in showing the many and various ways in which America has tackled the problem of mental infirmity. Research, after-care, the study of social and individual conditions, occupation therapy, these are carried to an extent hardly envisaged in this country. Nevertheless the public institutions are very large, often greatly overcrowded, although they have a relatively large and highly trained medical staff. Movement of patients is far more free than here; admissions and discharges are relatively much greater. But when all this has been granted there is somehow left in the mind the query, are the patients better off in America? Have they really a greater chance of recovery? Is their treatment by the State and by the staff of the hospitals more sympathetic than it is in this "lawyer-ridden" country of ours?

A PRESENTATION has been made to Dr. A. Brown Ritchie by members of his staff, on his retirement from the position of school medical officer under Manchester authority.

BRITISH EMPIRE CANCER CAMPAIGN.—At a recent meeting of the Grand Council of this Campaign the following grants were approved: £2500 to St. Bartholomew's Hospital for work including the continuance and development of investigations in the deep X ray treatment of cancer, and the further study of malignant growths by slow-motion photography; £950 to St. Mark's Hospital towards its cancer research work; and £200, making a total grant of £300, to the Yorkshire Council of the Campaign towards a special statistical inquiry into the incidence of cancer shown by post-mortem investigations at some of the principal Yorkshire, Scottish, and London hospitals. The Council also confirmed a grant of £3900 to the Middlesex Hospital towards its cancer research.

The Council decided to convene an informal meeting to review present activities, and consider what further lines of research might be inaugurated. It will take place shortly after the Midsummer recess.—The Council approved the publication of a popular book on cancer which has been drafted by the investigation committee. This book has been prepared so that it can be appreciated by the lay public.—It was reported that the British Dental Association had nominated Mr. C. H. Howkins to serve as its representative on the Grand Council, and that, Dr. Powell White having retired through illness, the Christie Hospital, Manchester, had nominated Prof. John Shaw Dunn to serve in his stead.

Annotations.

"Ne quid nimis."

ROBERT BRIDGES.

THE death on Monday last of Robert Bridges, physician and poet-laureate, at the age of 85, brought to an end an interesting career—especially interesting because the finest flower of his intellectual achievement did not blossom until his last year. An uninformed reading of his life would lead to the idea that he drifted from medicine because he was unfitted for its pursuit, and that when he discovered his métier as poet he was too aloof and too severely artistic to be the interpreter of ideals which would inspire a work-a-day world. Robert Bridges, as a matter of fact, was a successful physician before he allowed the influence of classical studies at Eton and Oxford, and the urge, gradually growing in intensity, of poetic production, to detach him from our ranks. And although much of his poetry was directed to an audience composed of the highly educated, and even of the severely cultivated, neither its melody nor its teaching asked for any extraordinary intellectual grasp from the reader. And the fervour and patriotism of his singing was slowly making appeal to an increasing number of readers when last year he published the lovely "Testament of Beauty," wherein deep religious feeling was blended with the humanism of medicine and a knowledge of its fundamentals. In Robert Bridges all medicine had a great colleague, and its followers may well regret that his long life is closed.

THE ASTHMATIC REACTION IN CHILDREN.

WORKING in the University Children's Clinic in Berlin, Dr. J. Tuscherer[1] has analysed the records and made clinical observations on 152 cases of asthma or allied disorders. The diagnosis in four instances proved to be wrong, while in 12 other patients the illness was so short as to make the diagnosis doubtful. Tuscherer prefers the term "asthmatic reaction" for the cases he describes, and he would include under this heading all examples of true asthma, bronchial asthma, and nervous asthma as occurring in adults, the bronchial asthma and asthmatic bronchitis of children, and the spasmodic bronchitis of infants. As regards the mechanism of the attacks he follows modern authorities in analysing this into its nervous and secretory components (spasm plus excess of mucus in the bronchi), but he does not agree that the underlying nervous predisposition to the disease is necessarily inborn. Nevertheless, analysis of the family histories of the patients in this series showed asthma in the father in 12, in the mother in 11, in the grandparents in 15, and in other relatives in 16; 17 of the asthmatic patients had a family history of nervous trouble. The age of onset of symptoms varied in the series, but Tuscherer shows that first attacks may date back to early life. Three of his patients undoubtedly began to show signs of the asthmatic reaction during the first four months, and he gives details of one of these cases admitted with a respiration-rate of 85 per minute and an acute spasmodic bronchitis, rapidly clearing, at the age of only nine weeks. Subsequent history showed that this early attack was the beginning of the asthmatic reaction in this child. The association of asthma in children with the "exudative diathesis" of Czerny is emphasised, and the relation of infantile eczema to asthma is also brought out in this series. The alternation of asthma and eczema in the same patient was well illustrated in some of the cases analysed. The influence of infectious fevers in bringing out a latent disposition to asthma was seen in many instances. In the whole series of 152 cases the first asthmatic symptoms followed whooping-

[1] Jahrb. f. Kinderh., 1930, cxxvii., 20.

cough in 22 patients, measles in 11, and pneumonia in 22. In connexion with the last-named there is, of course, the fallacy that so-called pneumonia may really have been the first attack of asthma. Nasal catarrh was present in 73 cases, enlarged tonsils in 29, a tendency to run a temperature without obvious cause in 27, and "chills" preceding the asthmatic attack in 31. Climatic influences were also considered, and in 29 patients it was thought that the asthma was influenced by the weather. Psychical shock appeared to be responsible for precipitating the asthmatic attack in one case. As regards pathogenesis, Tuscherer sums up in favour of an unstable respiratory centre where stimuli both from higher parts of the brain and from other parts of the body may precipitate an attack. Prognosis can be summarised by saying that of the 152 patients 35 had lost their asthma before puberty, and 39 became clear of attacks after puberty.

THE HOSPITAL PATIENT FROM HIS OWN POINT OF VIEW.

THE charge is often levelled against hospitals that the patient is regarded as merely a case, while his personality is largely, if not entirely, neglected. To a certain extent this is inevitable, and for the most part those admitted are so appreciative of the medical and nursing attention they receive that they do not greatly resent the lack of that personal interest which forms a large part of the private practitioner's business. They are also marvellously tolerant of long delays and complicated processes which are never explained to them. Nevertheless there has been a definite change of attitude since the hospital service has been extended to the middle classes. Dr. W. S. Goodale[1] who takes up the cudgels on behalf of the patient as an individual, urges the speeding-up and synchronising of such preliminaries as the admission history, the bath, the interview with the almoner, the students' and house officer's history and examination, and the delayed and all-too-brief and uncommunicative visit of the physician or surgeon. The patient's next trouble is his food. The "house diet," says Dr. Goodale, "unalterable as the laws of the Medes and Persians, and garnished with a prune, apparently is planned for its calories and vitamins but with little regard, if any, for individual taste, much less national appeal." Why should not attractive alternatives be offered? He next attacks hospital smells and sounds, and contrasts the filtered, washed and cooled air of the picture palace with the mixed odour of iodoform, carbolic, creosote, sweat, bad teeth, and boiling vegetables that the hospital patient sometimes has to breathe. He also urges daily visiting for all convalescent patients; since this is allowed in private wards it cannot be consideration for the patient's welfare that restricts visiting in the public ward to four or five hours a week. He criticises the inadequate supply of nurses, and remarks, "If there is one nurse allotted to 10 or 12 patients during the day-watch and one nurse to 18 or 20 during the night-watch, the observing patient is soon able to phrase a fairly good working definition of 'delayed service.' ..... Why not a patrol nurse whose sole duty is to visit all patients voluntarily and to inquire whether or not she can be of service?" The tediousness of convalescence can be greatly reduced by a good library service and an educational occupation system. His proposed social service involves several revolutionary suggestions. The remark "no inquiries about patients can be answered by telephone" is familiar enough in the telephone directory and is certainly necessary as long as one harassed porter has to attend two large switch-boards as well as perform the ordinary duties of a door-man. Dr. Goodale suggests that a special social service should deal with all contacts with the public, providing a medium through which relatives and friends can blow off steam, whether by way of anxious enquiry or complaint. This department would also take over some of the duties now undertaken by the almoner, would see to the notification of relatives when a patient is on the danger-list, and make sure that every patient on discharge had suitable clothing, hair-cut and shave, at least a shilling in money, a proper destination, and an escort. It would also see to the reception of mourners and undertakers if the patient died. The anxiety of relatives is often very seriously increased by their inability to get any interview with a doctor, and Dr. Goodale suggests that representatives of the house staff should be present in the lobby or a special room at certain fixed hours of the day, ready and willing to meet the relatives of their patients. We are hardly yet ready in this country for his final comparison of a hospital with a hotel, and his suggestion that hospital management has much to learn from successful inn-keeping. Hotel employees, he says, have been trained to assume the attitude that the guest is always right and hotel managers have accumulated fortunes by astutely commercialising the Biblical aphorism "A soft answer turneth away wrath." Hospital employees and managers have both these lessons to learn. They are seldom, he admits, positively cruel, but their ignorance of psychology and their lack of attention to the personal aspects of their patient result in a negative cruelty expressed by a lack of that inexhaustible supply of kindness, consideration, and forbearance that the sick guest needs so much more than the healthy.

Dr. A. T. Holbrook, in an article accompanying Dr. Goodale's, maintains that hospitals are used too much for cases which might be treated outside them if the general practitioner made more careful examinations and used comparatively simple laboratory equipment in his own surgery. He also blames the practitioner for the state of affairs of which he complains so bitterly—i.e., that he is becoming a mere directing-post to specialists. The general practitioner of the future, he says, must have two qualifications—competence and honesty. He must be able to recognise and willing to call in help for conditions that are beyond him, but he must also be prepared to do conscientious and scientific diagnostic work in a measure quite uncontemplated by his predecessors.

[1] Jour. Amer. Med. Assoc., March 29th, p. 905.

THE PATHOGENY OF ANGINA PECTORIS.

MANY hypotheses have been formulated to account for the pain of angina pectoris, but of them two only have received much support. The one attributes the condition to disease of the aorta, the other to coronary arterio-sclerosis. Neither is completely satisfying, for the accused organ has been found healthy at autopsy in unquestioned cases of angina, while gross lesions of the aorta or of the coronary arteries may be present in patients who have never experienced anginal pain. The absence of pain in patients with advanced coronary disease may possibly be accounted for by a hyposensitive nervous mechanism; but the occurrence of angina in the absence of any obvious anatomical lesion calls for further explanation. Probably it would be more correct to speak of angina, not as a disease, but as a syndrome which may be attributable to various causes which all act in a similar way—namely, by producing anoxæmia of the heart muscle. The whole subject is critically reviewed by Dr. Douglas Hubble elsewhere in our present issue. Diagnosis cannot be regarded as satisfactory until it is possible to say which cause of pain is operative in any particular case. Already one definite pathological entity has been separated off from the group of lesions which may produce cardiac pain. That condition is cardiac infarction following thrombosis or embolic occlusion of one of the larger branches of the coronary arteries. In addition to pain following the anginal distribution cardiac infarction is accompanied by dyspnœa,

vomiting, shock, and other symptoms, which together with the duration of the pain itself render its recognition possible during life. The diagnosis of coronary occlusion once infarction is complete presents but little difficulty, and the problem which now requires solution is how to differentiate the pain associated with the earlier phases of this process from that of ordinary angina. Dr. Hubble in his paper describes a case which has an interesting bearing on this problem. In his patient the actual occurrence of infarction was preceded during a period of several weeks by prodromal anginal attacks of increasing severity. Dr. Hubble emphasises the fact that, in these attacks, the pain, so far as its character and distribution was concerned, differed in no way from that of simple angina. The difference was that the attacks occurred quite apart from exertion or emotion and were not relieved by rest. They were often accompanied by dyspnœa. The pain in this case was temporarily relieved by nitrites, but returned as soon as the effect of the drug had worn off. Dr. Hubble suggests that the action of nitrites in relieving the pain of angina is due partly to a lowering of blood pressure and partly to a coronary dilatation which temporarily improve the collateral circulation; but, as he goes on to point out, a lowering of the general blood pressure may accelerate thrombosis. For this reason alone even during the prodromal phase, nitrites are contra-indicated in the treatment of coronary occlusion, and it is important that we should be able to differentiate between these forerunners of myocardial infarction and the ordinary attacks of simple angina.

MEDICAL ADVICE ON BIRTH CONTROL.

A COPY of certain correspondence which has taken place between the Society for the Provision of Birth Control Clinics and the General Medical Council has been sent to us, and although nothing will be served by publishing the whole correspondence, the question raised in it is an interesting one from the ethical side. At the beginning of March a letter was sent by the secretary of the Society to certain practitioners, asking if patients seeking advice on birth control questions could be referred to them; for the Society receives letters begging information from people not in touch with any of their clinics, and realises that answers can only be given adequately by a qualified medical practitioner. The invitation to coöperation was sent by one of its recipients to the General Medical Council, with the result that a communication was received by the Society from the Registrar enclosing the Warning Notice of the Council in regard to advertising and canvassing, and going on to say "if an allegation were received that this (notice) was being contravened together with adequate evidence the matter would receive very careful consideration." The Society has replied to the Council expressing a desire to keep the rules of the Council, but pointing out that the Warning Notice is not relevant, when the Council replied upholding the contrary view, and in so doing could justify its contention. Yet the matter is not quite so simple as either the secretary of the Society for the Provision of Birth Control Clinics on the one hand, or the Registrar of the General Medical Council on the other, appears to consider. From the point of view of the Council it must be pointed out that it is proposed through the instrumentality of the Society to send women to consult doctors other than their own—that is to say, that the practice of one doctor through the instrumentality of the Society may be extended at the expense of that of another doctor. But from the Society's aspect of the case, it may be pointed out that before the instrumentality of the Society is sought, the patient has, in most or all cases, already decided to obtain certain medical advice elsewhere than from her doctor—in other words, she is intending to exercise that free choice of doctor which is associated with all modern relations between the public and the medical profession. Advice on the subject from the medical aspect cannot be given by correspondence, while a patient might desire particular counsel from someone other than her own family practitioner. The Society should certainly point out to the medical practitioners who express themselves willing to help them the necessity, first, of keeping the patient's own doctor informed of the advice given, and, secondly, of impressing upon the patient the fact that this advice is being given in a special manner, and not in the routine of practice.

THE CURRICULUM IN RUSSIA.

ACCORDING to the *Moskauer Rundschau* of April 13th a Russian national conference was recently held, at which proposals for the reform of medical education were discussed. A plan for the reorganisation of medical schools, as proposed by the authorities, was considered and the conference suggested the lines on which the chief features of the plan should be embodied in practice. It is proposed to have three different kinds of medical faculty at the universities, instead of one uniform type as hitherto. The three types of faculty will be: (1) general medicine; (2) public health and preventive medicine; and (3) maternity and child welfare. The faculty of general medicine will include several subdivisions, such as general treatment, surgery and internal medicine, and will also have a maternity and child welfare branch. The public health faculty will provide courses of studies intended to produce experts in general sanitary science and its branches, such as epidemiologists, experts in the hygiene of housing, and specialists in industrial disease. The third type of faculty will educate specialists in maternity and child welfare, and in children's diseases. The length of a medical course in any one of the faculties will be three and a half to four years. Some of the medical students will be evening students, and at the largest medical schools complete evening medical faculties are to be opened. It is stated that this will enable the number of medical students to be increased to 11,000 even in the current year; there were 3300 last year. The conference recommended that the use of Latin medical terms, "handed down from the Middle Ages," is objectionable. Appropriate Russian words are to be substituted for Latin terms in the study of medicine, in all medical clinics and in prescriptions.

THE ANTI-INFECTIVE POWER OF CAROTENE.

Prof. Edward Mellanby and Mrs. May Mellanby have a flair for subjects in experimental dietetics which hold great possibility of benefiting the public health. Apart from their well-known work on rickets and on dental caries, Prof. Mellanby has recently concerned himself with the study of vitamin A as an anti-infective agent, and offers observations which may prove of much importance in preventive medicine. It has long been known that in rats whose diet is deficient in vitamin A the mucous membranes throughout the body become especially liable to septic infection. This is seen more particularly in the eye, the respiratory passages and adjoining glands, and the bladder, and in drawing attention to the phenomenon Prof. Mellanby has pointed out that the septic foci of inflammation which occur in the rat are also found in man.[1] Within the last two years the whole question of the relation of carotene to vitamin A has come once more under consideration, and there is now no conflict of opinion that purified carotene can act as an adequate source of vitamin A, although the nodal problem remains unsolved, whether carotene itself functions as vitamin A, or whether it contains an impurity which defies all ordinary means of separation. In their most recent contribution, Green and Mellanby [2] do not set themselves to attack this problem, but seek to ascertain whether, in vitamin A deficiency, carotene can supply

[1] Green, H. N., and Mellanby, E.: Brit. Med. Jour., 1928, ii., 691.
[2] Green, H. N., and Mellanby, E.: Brit. Jour. Exp. Path., 1930, xi., 81.

the anti-infective agency as well as classical, colourless vitamin A was found to supply it. To those who have worked with purified carotene its complete equivalence with colourless vitamin A from animal sources is already an accepted fact, but there are several other points in this paper which require notice. It is made clear, for instance, that carotene may be of value in any case where vitamin A therapy is desirable, for it lends itself to accurate dosage, and can be administered without the accompaniment of the various lipoid liver derivatives which usually form part of vitamin A concentrates of animal origin. Green and Mellanby have further made a significant observation on dosage. They find that while 0·005 mg. of carotene will promote growth resumption in the rat, a much larger dose—something like 0·02 mg.—is needed for complete protection of the animal from mucous membrane infections. It thus appears that the outward signs of vitamin A deficiency may be suppressed at a certain dosage, and the deficiency may be manifest solely by the liability of the mucous membrane to infection. This observation has an obvious and probably very important bearing on the relation of vitamin A deficiency to mucous tract infection in human beings. The nature of the disposition to infection which the deficiency causes is not further illuminated, but it is hoped that the experimental use of carotene may throw light on it.

Carotene, or related lipochrome pigments, is widely distributed in the world of living organisms,[3] but is derived in especially large quantity, as its name implies, from the carrot. If the animal experiments are found to apply to human beings they will go far to justify the enthusiasm which vegetarians often profess for these vegetables.

In the North, it may be noted, an old recipe for treating a sick horse is, "Give him a feed of carrots and leave the light on."

AN EXPERIMENT WITH BCG.

THE remote country district of Trysil in Norway has been chosen for an interesting mass experiment. Since August, 1927, it has been visited by five successive expeditions of doctors and medical students who, up to August, 1929, had carried out Pirquet tests in 2427 healthy persons, 1079 of whom were Pirquet-negative, and were inoculated with B C G tuberculosis vaccine once or oftener. In an account of this work by Dr. O. Scheel, Dr. R. Schultz-Haudt, and Dr. T. Skaar in *Norsk Magazin for Laegevidenskaben* for March, a résumé is given of their findings. The technique of the inoculations with B C G was not uniform; in 1927 and in August, 1928, it was injected into the subcutaneous tissues in doses of 0·05 or 0·025 mg. This technique rarely gave rise to abscesses. In November, 1928, the B C G was deposited in the deepest part of the cutis, the point of the needle passing from the subcutaneous tissues upwards to the deeper structures of the skin. The dose was 0·025 mg. and the incidence of abscesses was high (38 per cent.). In August, 1929, the dosage was reduced to 0·02 mg. and the vaccine was deposited just under, or in the deepest layers of, the cutis. Infiltration of the skin at the site of inoculation occurred sometimes directly or a few days after it, but more frequently from six weeks to three months after it. These infiltrations, up to the size of a pea, lasted for weeks and even months, but within a year they had either disappeared completely or had left a small scar or a bluish discoloration. They often ended in abscess formation, the pus being evacuated from one to three months after the inoculation. Spontaneous evacuation could be avoided by aspiration, repeated if necessary. The more superficial the level at which the B C G was deposited in the tissues, the greater was the proportion of the positive Pirquet reactions after the inoculation. Thus, when the B C G was administered by subcutaneous injection, the Pirquet test became positive only in 31 per cent., whereas it did so in 81 per cent. of the persons given the vaccine by cutaneous inoculation. The same was true of the two other sequels of the B C G inoculation—infiltration and abscess formation—which became more frequent as the level at which the vaccine was deposited approached the surface of the body. It is not yet clear whether these three sequels to B C G inoculation can be correlated with a comparatively high degree of immunity; the subsequent fate of the persons in Trysil given subcutaneous injections may throw light on this problem when compared with the fate of those given cutaneous injections of B C G. What is already of great practical interest is the tuberculosis morbidity in Trysil since this mass experiment was started. Between the beginning of the experiment and November, 1929, signs of tuberculosis appeared in 20 persons. In four of these cases there was a history of tuberculosis dating back some time—a history obtained in 254 cases. Among 923 persons who had not previously shown any sign of tuberculosis clinically, but who had been Pirquet-positive, there were 10 who developed signs of tuberculosis. Among 171 persons not inoculated, although they were Pirquet-negative when first examined, there were three who subsequently developed signs of tuberculosis. Among the 1094 who were not inoculated, who had previously shown no clinical sign of tuberculosis, and who had given either a positive or a negative Pirquet reaction, there were as many as 13, or 1·19 per cent., who subsequently developed signs of tuberculosis, whereas among the 1079 Pirquet-negative persons who were inoculated, there were only three, or 0·28 per cent., who subsequently developed signs of tuberculosis. In all these three cases the contact which had been the source of infection was discovered, and as in one of these cases the manifestation of tuberculosis (an outbreak of erythema nodosum) appeared only 30 days after the inoculation—i.e., too early for the inoculation to have taken effect—the number of cases in which the inoculation apparently failed to induce immunity to tuberculosis may be reduced from three to two, or from 0·28 to 0·18 per cent. Comparing the tuberculosis morbidity of 0·28 (or 0·18) per cent. among the inoculated Pirquet-negative persons with the tuberculosis morbidity of 1·19 per cent. among the controls who were not vaccinated, the authors of this report claim that they have already made out a very convincing case for B C G inoculation of Pirquet-negative persons at various ages; but they admit that their figures are still too small, and the observation period too short for a statistical analysis which will conform to all the conventional requirements of a study of this kind.

[3] See THE LANCET, 1929, ii., 392.

MOSQUITO PROOFING IN BARRACKS.

MOSQUITO proofing in barracks has done much to prevent malarial infection in the army in India for seven years; we learn from a recent paper by Dr. R. Reitler[1] that it is also being used in industrial buildings, for he safeguarded the workers at a power station of the Palestine Electric Corporation on the upper waters of the Jordan in this manner in 1927. He admits that the destruction of the larvæ is the most complete of antimalarial measures, but observes that the expense may be prohibitive, though to keep mosquitoes away from the men by screening may be practicable. In the case of the Jordan water nine months remained, as it happened, before the Jewish workers could be employed at the spot, so there was time to build satisfactory houses for them, the men building them being, meanwhile, protected with nets, constantly supervised. The 40 houses were cottages of cement-concrete, with overhanging roofs, the windows and ventilators were protected with wire gauze, and the entrances with double-doored porches.

[1] Arch. für Schiffs- und Tropen-Hygiene, vol. xxxiv., Part 4 (April, 1930), p. 198.

The houses proved inadequate in size or number, and the overflow workers were lodged in ordinary huts with well-supervised mosquito nets, thus providing a control for comparison with the special houses. A man went round daily to catch and destroy all mosquitoes, and found in the first seven months 12 in the houses, 1902 in the huts, 3017 in open clothes lockers; so the screening of the houses was effective. In 11 months 17 fresh infections occurred among 77 men in the huts (2·0 per month per cent.), but only 16 among 377 men in the houses (0·38 per month per cent.). Thus the benefit from careful proofing is evident. In one month the gauze of one house was damaged, and 100 mosquitoes were found in that house in one week, and a case of malarial fever developed there within three weeks. Dr. Reitler quotes with approval from J. B. Hanafin [2] that in the tropics mosquito proofing is as necessary to a house as is in the Arctic a source of heat. By itself, he says, proofing does nothing to reduce malaria in the area, unless as here the mosquitoes are captured and destroyed and the larvæ pursued in the usual ways.

THE BRITISH ASSOCIATION AT BRISTOL.

THE ninety-ninth annual meeting of the British Association will be held at Bristol early in September next, under the presidency of Prof. F. O. Bower, F.R.S. The Association has met at Bristol on three previous occasions, the first in 1836 when Lord Northampton, its President, laid the first stone of the Clifton Suspension Bridge, and the Geological Section had first-rate opportunity for field survey in the cuttings then being made for the Great Western Railway. At the meeting in 1875 Sir John Hawkshaw presided, and 1898 was memorable for an address by Sir William Crookes on the future wheat supply. Since that date Bristol has become a University city and the Association will meet this time in some of the finest academic buildings in the world, thanks to the generosity of the Wills family and the designs of Sir George Oatley. The programme will open on the evening of Wednesday, Sept. 3rd, with the presidential address in the Colston Hall on Size and Form in Plants. Addresses by sectional presidents to be delivered during the ensuing week will include (Chemistry) Prof. G. T. Morgan, F.R.S., on a State Experiment in Chemical Research; (Anthropology) Dr. H. S. Harrison on Evolution in Material Culture; (Physiology), Prof. H. S. Raper F.R.S., on the Synthetic Activities of the Cell, and (Psychology), Prof. C. W. Valentine on the Foundation of Child Psychology. Many of the discussions will be of wider scope through the merging of two or more sections for the purpose. For instance the sections of botany and agriculture will discuss the Mineral Element in Plant Nutrition; the Sections of physiology and psychology will discuss In What Sense Can We Speak of Primary Colours? And the three sections of geology, geography, and anthropology will discuss the Relation between Past Pluvial and Glacial Periods. These discussions will afford the opportunity on which the Association is based for conference and coöperation between scientific workers and others interested in all departments of science. Evening discourses will be given on Sept. 5th by Prof. E. V. Appleton, F.R.S., on Wireless Echoes; and on Sept. 9th by Dr. R. E. Slade on the Nitrogen Industry and our Food-supply. Public lectures will be arranged in Bristol and the neighbouring towns. The acting general secretary of the Association for 1929–30 is Prof. F. J. M. Stratton, and the local honorary secretaries for the Bristol meeting are Dr. W. Ludford Freeman, Dr. Bertram H. Rogers, and Prof. A. M. Tyndall. Between now and the Bristol meeting a loan exhibition of antiquities from Southern Rhodesia will be on view in London at the Assyrian basement of the British Museum. These are the result of excavations undertaken for the Association by Miss G. Caton-Thompson at Zimbabwe and other Rhodesian sites last year. Admission will be free during the hours when the museum is open. Future arrangements include a centenary celebration in London in September of next year, and meetings at York in 1932 and Leicester in 1933.

[2] Jour. R.A.M.C., 1928, li., 127.

CYANIDE POISONING IN HOTELS.

Dr. Huntington Williams [1] records a number of cases of acute non-fatal cyanide poisoning apparently due to consuming silver polish. In June, 1928, he says, about 30 persons became acutely ill after dinner at a hotel in Utica. No evidence of food deterioration could be discovered, but on examination the powder used for cleaning silverware was found to contain over 20 per cent. of sodium cyanide It was ascertained that similar cases had occurred at many hotels where this compound and others containing cyanide were used as a routine. Usually the utensils were dipped about once a week in a solution containing the poison, and the result was that ineffective rinsing might easily lead to poisoning of the next guest who used them. Oddly enough, none of the servants employed in cleaning silver seem to have developed symptoms. These were acute gastro-enteritis with vomiting, purging, and later, signs of shock. In one of the cases recorded, diarrhœa was so violent and persistent that finally the patient was passing watery mucus; in another, blood-stained stools were passed. The shock was so severe that in more than one case the illness was critical, with pallor, sweating, dyspnœa, and thready pulse; in several cases also there was albuminuria. The managers of the hotels usually received the explanation with gratitude, and stopped the use of the dangerous preparations. Certain hotels which had received complaints of food poisoning from their guests have been able to record the disappearance of such complaints since these polishes have been abandoned. Legislation to prevent this danger has been attempted in the State of New York, where the sanitary code has been amended to forbid the use of any cyanide preparation or other poison for cleaning nickel, copper, or silverware, or other articles used in the preparation of food. The Department of Health of Newark, New Jersey, has placed a similar ban on the use of poisonous compounds for cleaning silverware, and warnings have been given through the American medical press.

THE DECLINE IN VENEREAL DISEASE.

THE gradual but steady decline of syphilis in European countries since the late war must be attributed largely to the intensive Government campaigns against the disease. The legislative measures employed by various countries provide interesting contrasts.[2] In Germany every person infected with venereal disease must, by law, attend a doctor, and if necessary his attendance can be enforced until treatment is complete. Though marriage while in an infective state is not at present forbidden, the patient is legally responsible for informing his betrothed of his condition before the marriage takes place. The power to refuse medical care is suspended in the case of venereal disease, and the sale of unofficial remedies is forbidden. This legislation only came into force in February, 1927, but previous public health work had reduced the incidence of syphilis considerably; in 1919 the incidence of new infections was reported as 8·7 per 1000 inhabitants, and in 1927 this number had fallen to 5·8. In the United States of America notification of his disease by the patient is compulsory, but variably enforced in different States, so that statistics cannot be exact. The annual incidence of new cases is estimated at about 1·5 per 1000 inhabitants, while the number of cases treated, old and new together, is roughly 4·2 per 1000. Among the negro population the incidence is higher,

[1] Jour. Amer. Med. Assoc., March 1st, p. 627.
[2] Bull. de l'Office Internat. d'Hyg. Publique.

standing at 2·4 per 1000, while the percentage of positive Wassermann reactions stands at 20 to 24. A steady decrease in syphilis in the army coincides with an equally steady, unexplained, rise among marines. The death-rate from general paralysis has fallen, but whether this is due to more efficient early treatment, reduced incidence of syphilis, or the use of malario-therapy cannot yet be decided. Probably all three have played a part. In France the incidence of primary infections is said to have fallen from 21·1 per 1000 in 1917 to 2 per 1000 in 1928; stillbirths fell from 48·3 per 1000 births (of living and dead children) in 1916 to 37·6 per 1000 in 1928. The venereal service has been developed, and propaganda has been undertaken on a large scale. In Algiers an energetic attempt is being made to combat these diseases, but it is still too early to demonstrate marked results, though the number of skin lesions among the populace seems to be decreasing rapidly. In Great Britain the effects of propaganda are shown by an increasing tendency for patients to continue treatment until cure is complete. Seventy-seven laboratories in England and Wales undertake the performance of the Wassermann reaction. The incidence of new cases is now assessed at less than one-fifth of the average annual incidence between the years 1911 and 1918. Infant mortality from syphilis has fallen from 2·03 per 1000 births among children under one year in 1917, to 0·71 in 1928. In Egypt and Turkey anti-venereal campaigns are being undertaken, but here again it is too early to estimate their results. In Yugoslavia stringent legal measures are taken against persons who infect others with disease during the course of their own treatment.

TRANSMISSION OF THE VIRUS OF DENGUE.

THOUGH a number of different mosquitoes have been incriminated as possible dengue vectors, the only species accepted as the unquestionable carrier is *Aëdes ægypti* (*Stegomyia fasciata*). Certain observers have suggested the possibility that other species, including *A. albopictus* (*S. scutellaris*, Walker), may also transmit the disease, but the results obtained by Koizumi, Yamaguchi, and Tonomura when they investigated the rôle of this insect were inconclusive. It appears that in the Philippine Islands *albopictus* is widely distributed; the larvæ are often found in the same breeding places as *ægypti*, and the relative proportion of *albopictus* has been shown to increase in June and July at which time dengue fever was prevalent in Manila. Simmons, St. John, and Reynolds[1] report experiments with a strain of dengue fever maintained since December 1928, by passage through six different batches of *ægypti* and six human volunteers. The imagines of *albopictus* had emerged from larvæ collected about Manila. On July 16th, 1929, 100 female mosquitoes of this species were given an opportunity to feed on a volunteer patient who had developed typical symptoms of dengue fever 12 hours earlier. The successfully fed mosquitoes were kept for a minimum period of 13 days before tests were made to determine their ability to transmit dengue to man. Each volunteer was isolated in a screened cubicle in a screened ward. The supply of virus was obtained in the first instance by transference from one volunteer to another through selected *ægypti*. Finally one volunteer developed dengue from the bite of a single mosquito and upon his blood a group of 54 female *albopictus* were fed. After periods of 15 and 20 days respectively, small groups of this batch of mosquitoes were tested on two volunteers, both of whom developed dengue fever five to seven days later. In all, seven successful transmision experiments were carried out, indicating that *albopictus* is highly susceptible to infection with the dengue virus. From the evidence already collected regarding the widespread distribution of *albopictus* in the Far East, it is obvious that this mosquito must be considered as a serious factor in the dissemination of dengue fever.

Not only has it been found possible to pass the dengue virus from volunteer to volunteer with precision, but also to transfer the virus from infected to normal *ægypti* without passage through a vertebrate host.[2] This was done in an ingenious manner by filling a cell (an ordinary rectangular staining dish) with citrated human blood and macerated dengue-infected *ægypti* over which the fresh depilated skin of a guinea-pig had been stretched and clamped. The apparatus was kept at 37°C. and inserted into a cage containing normal laboratory bred insects. The mosquitoes were at once attracted to the skin and in a short time most of them became engorged with the blood mixture. Subsequently they produced typical dengue fever in two American volunteers after an incubation period of six days. This method of infecting mosquitoes in the laboratory promises to be of distinct value in the study of virus diseases transmitted by mosquitoes.

[1] Simmons, J. S., St. John, J. H., and Reynolds, F. H. K.: Philippine Jour. Sci., February, 1930, p. 215.

[2] Same authors: Ibid., March, 1930, p. 381.

THE CASSEL HOSPITAL.

THE current report of the Cassel Hospital for Functional Nervous Disorders at Penshurst deals with the patients who were under care in the calendar year 1928. Of 67 cases of anxiety state, 60 improved while in hospital, and 54 were known to be well and improved a year later. Of 25 cases of hysteria, 19 improved while in hospital, and 15 of them were known to be well and improved a year later. Two obsessional compulsive cases both obtained lasting benefit. The 16 psychoneurotic patients who did not improve or who relapsed within the year are reviewed in detail. Three who improved but relapsed were all people of poor morale, and their temporary improvement could only be attributed to their residence in a sheltered environment. None of the patients discharged during 1928 subsequently claimed to have been cured elsewhere. According to custom the group labelled "psychopathic personalities" was kept as small as possible; four out of the nine patients comprising it showed marked improvement, and the others suffered from alcoholic or drug addiction. Of the 17 patients with schizophrenic symptoms two recovered, and out of nine depressed psychotics two went out well, but one has since relapsed, and three of those who were discharged unimproved have since recovered. Two patients suffering from hypochondria were discharged unaltered. Full tables are given in the report, and the individual cases described will be of interest to all who have to deal with problems of this kind.

THE Rockefeller Foundation has made a grant of £2000 a year for two years towards the work of the National Institute of Industrial Psychology. The institute, it is stated, has already received £14,500 from the Foundation.

THE library of the Royal Society of Medicine is in future to remain open until 10 P.M. on Thursdays as well as on Tuesdays and Fridays. All Fellows not resident or practising within one mile of the Society's house may now have books sent to them from the library, carriage paid.

Sir Alfred Watson, the Government actuary, has issued a report on claims for benefit under the Insurance Acts received by a representative group of approved societies. It is shown that the proportion of men claiming sickness benefit rose from 14 per 100 in 1921 to 23 per 100 in 1927, corresponding increases being recorded among women. In the latter year 430 out of every 1000 women drew sickness or disablement benefit, or both. Sir Alfred believes that the conditions of 1927 have not subsequently been alleviated.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LXIX.

SIGNIFICANCE OF PROTOZOA, SPIROCHÆTES, AND HELMINTHS IN THE BLOOD.

PART II.*

Trypanosomes.

AFRICAN trypanosomiasis is the most typical tropical disease in so far that it can be acquired only in tropical Africa. The classical picture of the fully developed trypanosomiasis is seldom seen in European patients. The cardinal signs of trypanosome fever, its adenitis, the typical rash, and the nervous involvement may not all be evident at the same time, and yet the patient may be suffering from trypanosome infection. In the early stage of the infection the parasite circulates in the blood stream, but later it invades the central nervous system, penetrating the brain substance and invading the cerebro-spinal fluid. Even in heavy hæmic infections in man the trypanosomes are never so abundant in the blood stream as they are in artificially infected animals, such as the rat and the guinea-pig. Moreover, experience tends to show that the abundance of these parasites in the peripheral blood does not necessarily indicate that the disease is more severe or less easily curable than when they are scanty and extremely difficult to demonstrate. Two forms of human trypanosomes are recognised in Africa, an acute form due to *T. rhodesiense* and a more chronic and less virulent form due to *T. gambiense*. It is difficult, almost impossible, to differentiate these two diseases by the morphology of the circulating trypanosomes, and their identity can be determined only by sub-inoculation into susceptible laboratory animals. On the whole it may be said that in *rhodesiense* infections the trypanosomes are more abundant in the blood stream and that they tend to recur in showers, each corresponding to an increased pyrexia and an intensification of the objective symptoms of the disease. In the microscopical diagnosis of a suspected case prolonged and careful search of the blood is necessary. A wide field of the blood film must be examined; it is inadvisable to search with high powers of the microscope, for the trypanosomes can be readily picked up with the 1/6 in. lens and a wider field of blood thereby surveyed. The clinician cannot, however, rest assured with one negative blood examination for trypanosomes. I have had cases in which the organism has only been demonstrated after the twentieth consecutive test. As has already been stated, the parasite tends to appear in waves. The most likely period for successful search is when the patient exhibits by malaise, headache, splenomegaly, adenitis, or the characteristic rash, an exacerbation of symptoms. The recognition of one undoubted trypanosome in the blood film is an absolute assurance of a correct diagnosis. I have had two cases in Europeans, both terminating fatally, in whom only one trypanosome had been found in the blood stream during observations extending over one year, and in both there was a heavy infection of the brain and cerebro-spinal fluid with the organisms. In a wet blood examination auto-agglutination of the erythrocytes, which is frequently seen in trypanosomiasis, is very suggestive, though not necessarily pathognomonic. The employment of thick blood films is of doubtful advantage; centrifugalised citrated blood taken from a vein may be used. Puncture of the affected lymphatic glands and examination of the abstracted lymph for trypanosomes may give a greater chance of a positive diagnosis than blood examination. In cerebral trypanosomiasis the trypanosome may or may not be present in the cerebro-spinal fluid but the cell or globulin content is invariably increased so that, in the absence of any other positive evidence, this should be considered conclusive. Inoculation of 2 to 10 c.cm. of suspected blood into some susceptible laboratory animal may be tried, though with the non-virulent strains of *T. gambiense* even this may not be effective in proving the diagnosis.

There is another form of human trypanosomiasis, Chagas' disease of South America, caused by *Trypanosoma (Schizotrypanum) cruzi*. It is primarily a disease of the armadillo and occurs as an accidental infection mostly in children, in whom the parasites may be found sparingly in the blood.

Leishman-Donovan Bodies.

Kala-azar is a tropical fever, with splenomegaly, great emaciation, and enlargement of the liver which has to be differentiated from chronic malaria, with which it has many features in common. The Leishman-Donovan body, the specific parasite, cannot generally be demonstrated in blood films, so that other criteria, such as the associated fever, the splenomegaly, the characteristic leucopenia, and a positive serum-formalin reaction must be taken. The diagnosis is clinched by splenic or hepatic puncture and the demonstration of the parasite in films of pulp withdrawn from these organs. At the same time the abstraction of 2 c.cm. of blood from a vein into 1 c.cm. of sodium citrate solution in a sterile test-tube is recommended. The deposit at the bottom of the tube is inoculated into tubes of Novy, Nicolle, and MacNeal's medium and incubated in a cool incubator. By this means it is possible in a large percentage of cases to culture the organism from the blood. In some forms of kala-azar, notably in Madras and Assam, the parasite can be found in the blood in about 20 per cent. of cases examined, especially if thick blood films are used and when the blood is diluted in Locke's solution and subsequently centrifugalised. If all the available methods are employed, the diagnosis of kala-azar is rarely missed.

The Treponema of Relapsing Fever.

Relapsing fever is a widespread and almost cosmopolitan disease of very variable intensity. The most virulent is the "tick fever" of Central Africa. The *treponemata*, or spirochætes, are usually demonstrable in the blood in the febrile periods, often in great numbers, and they are easily detected in blood films stained by Leishman's stain. But there are mild cases in every epidemic in which the parasites are very scanty in the peripheral blood and then thick blood films have to be employed for their demonstration. For the proper appreciation of the diagnosis of relapsing fever it is necessary to remember that the parasites are completely absent from the peripheral blood during the apyrexial period and that in the febrile paroxysms, even when the patient is acutely ill with symptoms of the disease, the spirochætes become broken up and disappear 48 hours or so before the crisis. It may therefore be necessary to make a diagnosis of relapsing fever in the absence of a positive blood examination. In this disease there is a well-marked polymorphonuclear leucocytosis which persists during pyrexia, but disappears during apyrexia. A leucocytosis may therefore be of considerable assistance in suggesting the diagnosis.

Leptospira Icterohæmorrhagiæ.

The organism responsible for infective jaundice, or Weil's disease, the *Leptospira icterohæmorrhagiæ*, exists in the blood stream in the febrile period, and may be transmitted to guinea-pigs by intraperitoneal injection of whole blood. Indirect methods of diagnosis have to be used, since this organism can hardly ever be detected by ordinary blood film examination.

* Part I. appeared last week.

The Filaria.

It is generally assumed by those who have not practised in the tropics that *Filariasis* is merely of academic interest, but this is by no means true. The most important parasite is *Filaria bancrofti*, in which the adult worms inhabit the lymphatic channels, while the corresponding embryos, or *microfilariæ*, are found circulating in the blood stream. This filaria gives rise to a number of clinical manifestations, of which filarial adenitis, hydrocele, filarial lymphangitis, and elephantiasis are the chief expressions. The most ready method of making a diagnosis is by the discovery of the microfilariæ in the blood stream, and, as is well known, in the typical *F. bancrofti* infection, these minute nematodes appear in the peripheral blood only during the hours of night so that in a straightforward case of filariasis only night specimens of blood will be positive. It is necessary to take enough blood to render discovery of microfilariæ possible. Thick films only should be used. In the Pacific variety of *F. bancrofti* the embryos appear in the peripheral blood by day as well as by night, a circumstance which cannot as yet be satisfactorily explained. Many factors combine to render diagnosis of filariasis by blood examination extremely difficult. It has been found that the adult parasites can exist for several years in the body without the presence of microfilariæ in the blood stream and also that the more damage the adult worms produce in the tissues, the more difficult it is for the corresponding microfilariæ to enter the blood. So that we are presented with this curious anomaly—namely, that the more extensive the external signs of filariasis become, the less easy is it to make a positive diagnosis by blood examination. Under these circumstances other aids to diagnosis must be called into operation. *Filaria bancrofti* infection gives rise to a considerable degree of eosinophilia, usually ranging from 15–20 per cent.

In *Filaria loa* (*Loa loa*) infections, which prevail on the West Coast of Africa, a somewhat similar problem presents itself. The patient may suffer from manifestations of this infection and be conscious of harbouring filaria worms in his body for as long as six years without at the same time exhibiting the characteristic microfilariæ in the blood stream. These embryos appear in enormous numbers in the daytime only, in contra-distinction to the habits of *F. bancrofti*. *Loa loa* gives rise in the stages of invasion to a very high eosinophilia, possibly up to 60 per cent., and this eosinophilia may be an important diagnostic pointer when microfilariæ cannot be found.

Filaria perstans (*Acanthocheilonema perstans*) is another parasite prevalent in Central Africa. The patient may harbour several adult nematodes for years without the appearance of the characteristic unsheathed microfilariæ in the blood. This worm also produces a high degree of eosinophilia, which may constitute the only tangible evidence of the presence of the parasite in the body. The microfilaria perstans can be found in the blood both by day and by night, but it exists usually in small numbers, so that a considerable quantity of blood (20 c.mm. or more) has to be abstracted and searched.

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LONDON LOCK HOSPITAL.—At the annual meeting recently Lord Kinnaird stated that since the inquiry in 1928 every effort had been made to increase the efficiency of the hospital. The board of management has been enlarged to 18 members, one-third of whom, for the first time in the history of the institution, are women. Maternity work more than doubled during the year, and the nursing arrangements of the male hospital have been entirely remodelled. The hospital, which is heavily in debt, has to face the cost of removing the training home to the country.

Special Articles.

THE SURGICAL CLINICS OF HEIDELBERG AND FRANKFURT-ON-MAIN.

Notes on a Recent Visit by

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SURGEON TO THE LONDON HOSPITAL.

A VISIT to a foreign clinic is always of interest, for we may be brought into contact with standpoints quite different from our own, and with organisation, methods, and resources from which there is much to be learnt. At the present moment, when relations with Germany are again being resumed, a visit by a group of surgeons to the clinics at one of the oldest universities and at one of the most important business centres is a matter of general interest, and I venture to record our impressions in the hope that others may share our very happy experience.

The Pilgrim Surgeons are a small group who have made it a custom to travel together for a week in every year, to see the work of others, and most of all to see it together. We have visited France, Switzerland, and Holland, and this year left London on Feb. 28th to visit Germany for the first time since the war.

We selected Heidelberg and Frankfurt as being within easy reach and as possessing surgical clinics of renown. Arriving at Heidelberg on Saturday evening we spent Sunday in the enjoyment of its beautiful surroundings. This is essentially a university town situated on the swift stream of the Neckar and surrounded by the wooded hills of the Black Forest. In term time its streets are crowded by its 3000 students, but now it was vacation and there was not one to be seen, but instead there were crowds of children parading the streets in fancy dress, for we had arrived in the middle of the Carnival.

Heidelberg: Prof. Enderlen's Clinic.

Monday morning at 9 o'clock found us in Prof. Enderlen's Clinic. He had very kindly arranged a series of operations for us and on this morning they included a large goitre in a woman of 44, cases of gall-stones in two women of 22 and 31, a gastrectomy for an old perforated ulcer of the stomach in a man of 32, and a perineal excision of rectum in a diabetic man of 47.

Prof. Eugen Enderlen is 67 years old, but there was no sign of his age in his dexterous technique. Although he spent infinite trouble in securing perfect hæmostasis, he succeeded in completing this considerable list of operations in three and a half hours, with intervals in which he discussed with us special points in technique. As in all Continental clinics, he has behind him a perfect organisation which includes 10 highly skilled surgical assistants, some of them of professorial rank. At one time we counted in the theatre two sisters, three nurses, and 15 other assistants of various grades, including of course the theatre men, and indeed we were compelled to admiration for an organisation which could make use of so many individuals to one purpose.

On Tuesday morning he performed for our benefit a similar list of operations, cases of goitre, of gall-stones, and of carcinoma of the stomach, and a thoracoplasty for pulmonary tuberculosis. The operations were, moreover, preceded by a tour round the wards commencing at 8 o'clock, and were followed by a demonstration of many old cases of interest. The Professor was tireless, and we began indeed to wonder whether there had not been some mistake in the date of his birth certificate.

The Surgical Unit over which he presides contains 250 beds, including 35 private rooms where patients pay from 8*s*. 6*d*. to 13*s*. 6*d*. per day. It includes a large out-patient department, and in accordance with continental practice the whole is under the absolute control of the Professor, whose assistants carry out all the pathological investigations he requires, make all the X ray examinations, and carry out much other work which would in England be specialised. The system has undoubted advantages in organisation, but it gives little opportunity to the younger men, whose initiative is unlikely to survive 10 or 15 years in a subordinate position. The wards were plainly but efficiently furnished, and it was evident that the Professor and his staff were on the best of terms with their patients, but we were scarcely prepared for the scene which greeted us in the Children's Ward. The whole of the children were celebrating Carnival. They had all been provided with masks and tin trumpets and our appearance was the signal for a deafening outburst. One small group were doing the thing thoroughly and fixing up one of their number with the aid of yards of strapping on a gallows splint as a case of fracture of the femur.

Of technical details the one which impressed us most was the method almost universally adopted in the treatment of fractures by means of Kirschner's wire. Instead of a thick pin, fine steel wire 1·5 mm. thick is passed through the bone by means of a special form of drill. The wire is then stretched on a frame and to this frame any necessary extension may be applied. The advantage over the ordinary calliper and pins is that the hole of entry is so small that infection is almost impossible, whilst the method may be applied with facility to such small bones as the metacarpals and phalanges. The control thus obtained of the fragments is very remarkable and enables the most perfect apposition to be achieved and maintained.

In the evening the Professor and three of his Assistants joined us at dinner and we spent some delightful hours in discussing the many interests we had in common. One thing struck us very forcibly, the high position held by a Professor in the regard of the public. It is true that Prof. Enderlen's long service has rightly earned for him a great position in Heidelberg, but Germany pays a tribute to intellectual power which is sadly lacking in England. In what English hotel would the social standing of its visitors be advanced quite obviously by the fact that the Professor of Surgery had done them the honour of accepting an invitation to dinner? We have other things to learn from Germany besides technique.

Frankfurt: Prof. Schmieden's Clinic.

From Heidelberg we went on to Frankfurt, and Wednesday morning found us in Prof. Victor Schmieden's Clinic. He operated for us in the magnificent demonstration theatre capable of seating 200 students, and equipped with every appliance that could be desired. He had selected for us two cases, both of considerable interest. The first was one of pyonephrosis of an abnormal kidney situated in the floor of the pelvis. It was approached by a transverse incision above the pubes which divided both recti muscles, and having been fully demonstrated across the peritoneum, it was finally reached from behind the peritoneum of the right iliac fossa and removed. The operation was technically difficult from the great number of blood-vessels which supplied the kidney and which appeared to come from the iliac vessels of both sides, but it was finally completed in a most satisfactory manner. The second operation was for a double duodenal ulcer, and was of interest from the fact that the precise character of the two ulcers and the mobility of the duodenum were all demonstrated beforehand by the radiologist. In accordance with Continental custom, the duodenum was resected and a modification of Polya's operation carried out. It is interesting to notice the disfavour into which gastro-enterostomy has fallen all over the Continent, and one wonders whether the large incidence of jejunal ulcer which is said to have occurred may be due to some difference in race or in diet, for English statistics show an entirely different picture.

The operations were followed by a lecture by Prof. Hans Holfelder on deep X ray therapy. He expressed the opinion that wave-length was not of such importance as has been alleged, and considered that it should be possible to obtain with deep X rays all the results which can be obtained with radium. Of the latter, however, he had no experience, as there is little or no radium in Germany. He described two cases of carcinoma of the stomach which he considered had been cured by X rays and 12 cases of carcinoma of the œsophagus, four of which had remained well over a considerable period.

After the lecture we were entertained at lunch by Prof. Schmieden and met several members of his staff including Dr. Herbert Peiper, his first assistant, who has specialised in neurological surgery and carries out all the cerebral work in the clinic. We also met Dr. Joseph Wirth, medical superintendent of the hospital, who told us something of its organisation. It is a public hospital, with 2500 beds and is supported entirely by the State. Of these beds only 350 are allotted to the Academic Surgical Service over which Prof. Schmieden presides.

The afternoon was devoted to a visit to the X ray department under the control of Prof. Holfelder, reputed to be the finest in Germany. It is accommodated in a building especially erected for the purpose, and it was equipped in a manner which excited our envy and admiration. The room for deep X ray therapy, in which we were chiefly interested, was divided into two large apartments, each containing a battery of three "cannons" containing Coolidge tubes. The high tension current was supplied from a stabili-volt apparatus by Siemens-Reiniger-Veifa, working at a pressure of 300,000 volts. Each cannon was a lead tube some 6 feet long by 18 inches in diameter, with a wall an inch in thickness, but this enormous mass of lead was so beautifully balanced that it could be rotated by a touch into any position, whilst vertical adjustments were controlled by a small motor. It is impossible to describe the details of the apparatus, but it was so easy to manipulate that a nurse could adjust it single-handed, whilst by a most ingenious system of interlocking the screening and exposure were made practically foolproof.

The diagnostic equipment, arranged on somewhat similar lines, was very complete and included a Titanos transformer by Koch and Sterzel, with an output of 100 milliamperes.

The Institute was fully equipped with ultra-violet and diathermy apparatus, but one of its most attractive features was a small lecture theatre surrounded by illuminated screens for the demonstration of films. The screens, which covered the greater part of two walls, were occupied by the current X rays of patients in the hospital and were demonstrated to us by Dr. Pansdorf, who is in charge of the diagnostic section. For absolute perfection of technique we have never seen anything to rival them, and as they covered almost every branch of radiography they were a striking tribute to the efficiency of the department.

On Thursday morning we again met in Prof. Schmieden's operating theatre where we saw two operations—an abdomino-perineal excision of the rectum for carcinoma in a woman of 25, and removal of the gall-bladder for gall-stones. The former was carried out on orthodox lines with a left inguinal colotomy and removal of the coccyx. Owing to the careful preliminary ligature of the mesenteric vessels there was remarkably little bleeding. In the gall-bladder case, access was obtained by an oblique incision in which the upper part of the right rectus was divided. In this case, as in all the other abdominal cases which we saw, we were very much struck by the facility with which the liver could be

brought down and access obtained to the bile-ducts. It would seem that mobility of the upper abdominal viscera and some degree of ptosis is a common feature of German anatomy.

The operations were followed by a demonstration by Prof. Holfelder of a number of cases treated by deep X ray therapy. Of a large number of cases shown to us the most interesting were the following:—

Carcinoma of thyroid, recurring after operation; treated six years ago.

Carcinoma of breast, amputated 14 years ago. Recurrence in spine treated nine years ago; in sternum, treated one year ago.

Carcinoma of breast, amputated seven years ago. Early recurrence in axillary and supraclavicular glands, treated at once; seven years ago.

Sarcoma of humerus, upper end, in baby of 4 months; treated four years ago. Series of X rays showing disappearance of the tumour and downward displacement of its site with growth of bone.

Lymphosarcoma of mediastinum, in boy of 18; treated four years ago.

Tumour of lung, probably a carcinoma; treated three years ago.

Pituitary tumours.—Two cases with severe visual symptoms; treated four and three years ago. Recovery of vision.

Hæmangioma of lip.—A huge tumour in a baby treated four years ago. Excellent result.

The cases were selected to show the late results of deep X ray therapy, and in none of them was there now any evidence of active disease. In cases of carcinoma of the tongue and of the uterus Prof. Holfelder claimed to have obtained results comparable with those of radium treatment, but he thought these cases too recent to be worth demonstrating. We were greatly impressed by the skill with which all the cases had been treated, by the magnificent apparatus, and superb organisation of the whole department, and by the thoroughly scientific manner in which the problems of deep X ray therapy are being attacked. We appreciated the very cautious optimism of Prof. Holfelder and his colleagues, who fully realise that they are engaged in pioneer work upon a very difficult and elusive problem

In the evening Prof. Schmieden invited us, together with the staff of his own department, to a glorious performance of *Lohengrin* in the famous State Opera House of Frankfurt, and afterwards entertained us all at supper at the Park Hotel. There was no one in the party who had not borne his share in the war, and as our first personal contact since the years of conflict we all felt it to be a very moving occasion. The atmosphere could not have been more cordial, and there was a very evident desire on both sides for the renewal of old friendships. Each of us felt that the very differences in our outlook, our methods and our opportunities, would make a partnership all the more valuable.

Conclusion.

We have come back with many happy recollections and with many new impressions. The old Germany which we remembered before the war, hide-bound in rigid discipline and aggressive militarism, seems to have disappeared, and in its place we found a liberated nation, imbued largely with our own ideals, but with an enterprise and a determination to succeed which somehow for the moment, but only, we believe, for the moment, we have lost. In spite of enormous difficulties Germany is rising again to take her place among the nations of the world, not as a menace, but as a hope, and her desire for our friendship is based not upon self-interest but upon a realisation of all that we hold in common.

CHARING CROSS HOSPITAL PATHOLOGICAL INSTITUTE.—At the annual meeting of the Governors Mr. George Verity stated that the Pathological Institute was "doing untold good" in examining patients who are not of necessity eligible for treatment in the hospital, but can be treated by their own medical attendants at home. The work will, however, be in jeopardy unless £1000 is quickly subscribed towards it.

RADIOLOGICAL SERVICES IN HOSPITALS.

A JOINT MEMORANDUM.

A MEMORANDUM on hospital policy regarding radiological services has been issued by the British Institute of Radiology, incorporated with the Rontgen Society, with the approval of the British Medical Association. Copies of the memorandum are being sent to all voluntary hospitals in Great Britain and Ireland, and to public health authorities now responsible for the transferred hospitals. Copies of the memorandum may be obtained from the Institute, 32, Welbeck-street, London, W.1. The text of the memorandum is as follows.

The Hospital Department.

A hospital receiving charitable contributions should not manage its radiological department so as to make a profit for the hospital by the exploitation of the professional services of the visiting radiologists.

The classification of patients shall be that of the British Medical Association's Hospital Policy, but for radiological services it is recognised that there will be exceptional patients for whom specially expensive examination and treatment is necessary, and for whom the income limits shall not be restrictive.

A hospital should require payment of fees from patients attending for radiological services except from those who are members of a contributory scheme which provides such services or from those who come within the category of "free patients." An agreed share of such fees, or an agreed honorarium, should be placed at the disposal of the medical staff.

A hospital may, on the advice of the visiting radiologist, arrange a schedule of modified charges for radiological services for patients within the scale of income limits, and based upon an average of one-half the fees commonly charged for similar private work in the district; but the schedule so arranged should not be published or exhibited publicly.

Its Relation to Outside Practitioners.

A hospital situated in a district where there are qualified medical practitioners carrying on in private the practice of radiology should not provide radiological services for any patient able to pay private fees for such services.

A hospital in a district where there is no other radiologist than the radiologist to the hospital may allow this officer to receive directly from private practitioners private patients who shall pay fees not less than those charged in private for similar cases in similar districts, and the radiologist should receive not less than two-thirds of the fees so paid.

Radiological services for statutory authorities—e.g., Ministry of Health, National Health Insurance, municipal bodies, &c.—should ordinarily be arranged to be supplied in private by private practitioners. Where such arrangements must be made with a hospital the fees payable for the services shall be made upon a scale made upon the advice of the visiting radiologist.

Admittance of Patients.

The normal approach to the radiologist is through the medical officers of other departments of the hospital, but in exceptional circumstances cases may be referred direct to the radiologist by private practitioners.

The hospital almoner or other proper officer should certify the suitability of patients for admission, and should assess and collect all payments from patients, but the right should be reserved to the visiting radiologist to receive direct the fees for medical services to private patients.

Fees for services to patients in pay beds should be paid to the visiting radiologist in each individual case, according to the service rendered, less an agreed proportion to the hospital to meet costs.

Remuneration of the Visiting Radiologist.

The minimum fee per visit of a consultant called in to a patient in a transferred hospital should be two guineas, with mileage in addition where necessary, and the minimum fee for each operation performed in such circumstances should be five guineas, the fee for a major operation being not less than ten guineas.

Where the remuneration of a consultant for regular periodic visits to a transferred hospital is on a salary basis, the amount of that salary should be a matter of arrangement between representatives of the local medical profession and the appointing authority, but regard should be had to the minimum fees laid down in the foregoing paragraph and/or to the basis of £2 12*s.* 6*d.* for consultant sessions of not more than two hours, with an allowance for mileage where necessary.

It is further agreed that case sheets and records of patients treated in hospitals including X ray films and prints should remain in the custody of the hospital; they must be regarded as confidential documents, and access to them allowed solely to the members of the visiting staff of the hospital.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. F. B. Quinn to be Surg. Lt.-Comdr.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub.-Lt. D. R. Goodfellow to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

Maj.-Gen. R. S. Hannay, late R.A.M.C., retires on retd. pay.

Col. H. C. R. Hime, late R.A.M.C., to be Maj.-Gen., vice Maj.-Gen. R. S. Hannay.

Col. C. R. Evans, late R.A.M.C., having attained the age for compulsory retirement, is placed on retd. pay.

The undermentioned Lt.-Cols., from R.A.M.C., to be Cols.: C. D. Myles, vice Col. C. R. Evans, and H. R. Bateman, vice Col. H. C. R. Hime.

Temp. Lt.-Cols. to be Lt.-Cols.: Maj. J. S. Dunne, vice Lt.-Col C. D. Myles, and Maj. and Bt. Lt.-Col. C. M. Drew, vice Lt.-Col. H. R. Bateman.

Majs. to be temp. Lt.-Cols.: Bt. Lt.-Col. F. A. McCammon and A. Dawson.

Lt. (on prob.) N. H. Lindsay from the secd. list is restd. to the estabt.

ARMY DENTAL CORPS.

Maj. D. Blair to be Lt.-Col.

INDIAN MEDICAL SERVICE.

Capt. E. T. N. Taylor to be Maj.

Lt. M. G. Kelley to be Capt. (prov.).

The undermentioned officers retire: Col. W. D. A. Keys, Lt.-Col. H. H. Broome, Lt.-Col. W. C. Ross (on account of ill-health), and Maj. E. Calvert.

HARROW HOSPITAL.—The annual report, which contains a foreword by Lord Moynihan, shows that last year's record of patient-days (12,873) is an increase of 10 per cent. By direct payment and through their contributory associations the patients provided £2399, which represents fully one-half of the cost of maintaining the hospital for the year. The district nurses and health visitors of the Harrow District Nursing Fund paid over 12,000 visits to 402 new cases. The cost averaged 1*s.* 4*d.* per visit.

A RAT-RIDDEN HOSPITAL.—Dr. O. F. McCarthy, medical superintendent of Cork Mental Hospital, reports that the institution is infested by "thousands of rats." The hospital's rat-catcher formerly accounted for 1200 a year, but poison has failed, and floor boards often have to be taken up to remove the dead rats. One of the patients is stated to be suffering from rat-bite fever, having been bitten by a rat which she caught in her hand. A professional rat-catcher is to be engaged.

Public Health Services.

SCHEMES FOR THE PREVENTION AND TREATMENT OF TUBERCULOSIS.

BY C. O. S. BLYTH BROOKE, M.R.C.S. ENG., D.P.H.,
TUBERCULOSIS OFFICER, STOKE-ON-TRENT.

AT a time when local government is in a state of reorganisation, it is opportune to consider the working of the schemes for preventing and treating tuberculosis. These vary much in efficiency, although all of them have evolved along the lines originally suggested by Sir Robert Philip. National expenditure on tuberculosis is colossal, and there is a loss to industry through ill-health of many millions of working days, as well as a continued, though somewhat decreasing, actual loss of life. Yet the true nature of the disease has been definitely known for nearly fifty years, and its manner of spread by infection is being daily demonstrated. The only sure road leading to reduction in incidence is to reduce the chance at any age of encountering massive infection. Experience at village settlements shows that the incidence of the disease can be reduced to a vanishing point; at Papworth and Preston Hall no single case of tuberculosis has occurred among the non-tuberculous population. It is well known, too, that a large number of cases of tuberculosis can, if not cured, be brought to a state of moderate working capacity by means of adequate treatment and after-care. Our present schemes fail because they omit to provide some necessary link in the chain; most frequently missing is the adequate supervision of those chronic cases which are responsible for the widespread dissemination of tubercle bacilli.

The essential aspects of prevention are the provision of a pure milk-supply and the isolation of every open case of tuberculosis, understanding by isolation the provision of accommodation under more or less ideal hygienic conditions. When the reorganised departments have become stabilised, many of the present extravagant schemes ought to be overhauled and in many cases set upon a firmer basis. In other cases where more money should be spent, it would soon reduce the incidence and mortality of tuberculosis to such an extent as to result in an actual saving.

The Dispensary.

The dispensary, which is bound to remain the centre of any scheme should be adequately staffed with clerical assistance in order that proper records may be kept, without too much time being spent by medical officers on details of administration. The chief tuberculosis officer must have wide clinical knowledge, with opportunities of doing general medicine. If it is inadvisable for him to engage in general practice, he should have charge of medical beds in some hospital and be allowed to engage in consulting practice; for the taking over of the poor-law hospitals should make this easy. Further, if he is to be a useful consultant in cases of tuberculosis, he must keep in touch with its treatment by having charge of sanatorium beds.

The dispensary must not be allowed to confine itself to pure routine work. It must remain a centre for consultation in doubtful cases, and a place where known patients can be seen by an expert when any radical change in treatment may be advisable; occasionally, too, it may be used for carrying out certain lines of treatment such as pneumothorax refills, &c. Frequent attendance at the dispensary is to be strongly discouraged, except where it is needed—on non-medical grounds—for after-care of patients. No one can examine many chests carefully at one sitting, and a rough examination engenders careless clinical work at other times. To do no more

than weigh a patient and say "good morning," although occasionally permissible, will lower the prestige of the clinic in his eyes, and make him ask why he should spend time and perhaps money on an attendance. The "good attender" is often the unfortunate chronic bronchitic who has once had and therefore always retains the label of "T.B." He is probably unfit for work or unable to obtain it, and he does not fear tuberculosis very much because he has found himself little the worse since the diagnosis was made; so he enjoys a morning at the dispensary. The real case is reluctant to come. For social reasons he does not wish to be seen attending often, and if he is lucky enough to have work does not want to risk losing it; also he very sensibly tries to forget about his complaint.

Among the many attenders of the first class, the second may even get almost forgotten. It is the large clinics of this kind that have become the laughing-stock of the medical profession, and have lost for the tuberculosis officer the respect and needful coöperation of the general practitioner. Careful visitation by nurses and common sense can best regulate this difficult situation.

If it is desired that the dispensary shall also be the centre for after-care for the provision of extra nourishment, and the like, then this work should be carried on separately. The clinician should not be cumbered with such routine work, and it may usually with advantage be delegated to an assistant medical officer—engaged mostly in other work, but anxious to obtain experience in tuberculosis—or to the junior medical officer of a sanatorium who wants to see another side to the life of a consumptive.

Contacts.

The value of the centre for the examination and supervision of contacts is much debated, and probably depends in each case on the possibility of doing anything if tubercle is discovered. In an efficient scheme, fully realised, such supervision is of great value if reasonably conducted. Children, in whom definite diagnosis is almost impossible, should attend only if they are unwell or not gaining weight, when they may be referred to the preventorium. To examine hordes of child contacts is waste of valuable time if it is done thoroughly, and is useless if done carelessly. In the adolescent group as many contacts as possible should be examined, and visited regularly by the nursing staff. Certainly they should be examined carefully if symptoms begin. But it is waste of time unduly to press men and women to attend, if they are not really willing and feel quite well. They will not believe that they have tuberculosis even if told so. If it is possible to improve home conditions, I think it is of great value to seek sources of infection among the older generation, some of whom may have chronic disease without knowing it. But where no practical good can come from the discovery of a case, it is not worth while to seek one, whose discovery may do no more than cause distress to relatives. When it is seen that nothing further is done, the prestige of the department is lowered. I am doubtful of the value of health lectures to such cases by nurses or doctors.

If people are to be encouraged to accept early treatment and carry out the instructions given, there must be no contravention of the spirit of the regulations about the secrecy of notification. The need for tact in this matter must ever be impressed on all members of the staff, for its failure hinders a lot of patients, I believe, from seeking earlier advice.

The Practitioner's Recommendations.

Much routine work could be avoided by usually accepting the recommendations of the general practitioner without further investigation. This would help to interest the private doctor in a complaint which has largely been taken out of his hands, and would raise his standing in the eyes of his patients. The services of the tuberculosis officer would, of course, be available whenever desired, and the right to examine any case before admission to an institution would be maintained by the medical staff in order to prevent abuse of the sanatorium as a dumping ground for undesirable patients. But as a rule, where a respected practitioner definitely recommends a certain line of treatment, it is advisable to follow it in the first place, and alter it only later if necessary.

Institutional Treatment.

Adequate institutional treatment must be available if the work of the dispensary is to be of value. It is of little use to diagnose an early case and have to wait until it is an advanced one before beginning treatment.

In the first place, beds will be needed for cases of so-called surgical tuberculosis, both for adults and children. Probably they are best placed in a special orthopædic hospital, and they require little further comment. But for cases of pulmonary tuberculosis, several classes of institutions are undoubtedly needed. First, beds are required for so-called observation cases in order to establish a definite diagnosis. Much time should not be spent here: the patient himself often demands an early diagnosis, and sometimes may be prepared to give up only a short time unless he is convinced that he really has tuberculosis. Personally, I think it much better that these beds should be provided at a local voluntary hospital. It is usually found that a diagnosis is sooner reached in such places, and no stigma attaches to the patient. Such arrangements tend to foster coöperation between the local and the hospital authorities.

Routine sanatorium treatment should be available for definite cases, whether sputum-positive or not, and also for doubtful cases in which pulmonary tuberculosis is the likely diagnosis, but in which cure may prevent a positive decision. The institution need not be run expensively; good food, open country, and graduated exercise are the essentials. Notification should not be required before admission to such a preventorium, for patients must not be deterred by fear of a stigma; moreover, every "open" case should be rigidly excluded, so that there may be no danger of contracting the disease if the provisional diagnosis is wrong. Such an institution would demand very little medical supervision, and prolonged treatment would seldom be needed.

For the next category of patient a hospital-sanatorium is essential. It must deal with cases in which treatment is likely to be of permanent benefit and it ought to have adequate medical and nursing staffs, and facilities for all forms of treatment. Combined surgical and pulmonary cases would be admitted here unless the prognosis were hopeless, and beds would also be available for surgical emergencies and other conditions complicating tubercle. This is necessary because at the hospital-sanatorium cases will receive more individual attention from the anæsthetist, surgeon, and nurses than they would usually get in the ordinary surgical wards of a hospital. It is important, further—and this is often omitted from tuberculosis schemes—to provide accommodation for the tuberculous woman who is about to be confined, and for her treatment during pregnancy. We know that after the birth of a child many go downhill rapidly, and if this is to be avoided they must have special care before and during labour. This is desirable, also, for the sake of the child, since only in an institution are precautions against infecting the baby likely to be sufficiently impressed on the mother. An antenatal and maternity ward would, therefore, form a part of the institution we are considering. It is occasionally desired to assess accurately the working capacity of the more chronic case, and this could rapidly be done in the hospital-sanatorium. This must necessarily be expensive, but not many cases under this heading will have to be dealt with unless a big area is drained.

Hospital accommodation for advanced cases should not be on too large a scale, or the hospital will certainly get a very bad name. Such accommodation may well be provided in several quite small institutions, which

must be near to the patients' homes in order to facilitate visiting; one at least of these is probably best attached to the former poor-law hospital. Adequate nursing facilities are, of course, necessary for such places, but the medical staff need only be small.

A further class of patient, and one that forms the great bulk of those provided for at the present time, lies between the two last considered. They are the chronic and fairly advanced cases, a large proportion of whom have positive sputums, and those who have undergone the treatment prescribed but are not well enough to return to unsatisfactory conditions of life. A modified convalescent home will accommodate the many chronic cases which every now and then need a little stimulus to continued existence—a principle recognised by the British Legion in their Douglas Home at Bournemouth, which has proved of great value to ex-Service men—and it will also take those who are not bad enough to go to the institution for advanced cases, though little good can be done for them, and those who have undergone treatment in the sanatorium, but are not yet fit for final discharge. Such a home need not be expensive, and could be run on very much the same lines as the preventorium. Graduated work would be provided for the earlier cases, and the more advanced could be allowed to potter about. Again, little medical supervision would be required, although in selected cases certain forms of treatment could be carried out or continued. The provision of such homes would greatly facilitate the removal of infectious cases from overcrowded surroundings where the patients are unwilling to submit to the discipline of a sanatorium, or to enter a home for the dying.

Children.

In outlining these types of institutions I have confined myself to the adult. The accommodation necessary for children is on similar lines, but may be reduced to (1) a hospital for the treatment of active and advanced cases, and (2) a preventorium for the convalescence of early and doubtful cases, as well as occasionally for contacts living in an infected household where the source of infection cannot be removed. However sceptical one may be of the value of the children's preventorium in the tuberculosis scheme, it undeniably plays a great part in the care of delicate children, whatever the cause of their debility.

After-care.

The whole scheme breaks down if proper after-care cannot be provided. Adequate food and clothing are, of course, essential, and these should now be readily obtainable in all cases through the newly constituted public assistance committees. In every case an endeavour must be made to obtain better environment, and when dealing with "open" cases this is necessary for the community as well as for the patient and his family. This can only be done by close coöperation with the housing authorities, and by the provision of hostels or colonies for the unmarried of both sexes. Any fear of the local authorities that it may be dangerous to set up such colonies should surely be allayed by reference to experience at Papworth. Further, if the patient is to maintain his general health (which is very important for all tuberculous cases), and is not to spend his time in overcrowded private rooms, cinemas, and public houses, an occupation suitable to his physical condition must be provided. This can usually be done only by subsidising some suitable industry; that it need involve no heavy financial loss is proved again by Papworth, as well as places like Leeds and Hull, where such industries are in operation.

Only, I believe, by consideration of all the points enumerated can a really adequate and economical scheme be carried through. If any part fails, the whole will fail in efficacy.

The expense of this ideal scheme would not be prohibitive if the area for which it is operative were large enough. But in many more places it would be found necessary for local authorities, if not to unite in joint committees, to contribute towards the cost of institutions which would provide for patients from several areas, as well as towards the salary of medical officers who might be part-time officers of another authority. The chief tuberculosis physician can well give his services for a population and an area much greater than those of most of the responsible councils.

If Sir Robert Philip's prophecy, made to the British Medical Association in 1928, that tuberculosis as a national problem would be completely solved in 50 years is to be fulfilled, improvement in our present work must soon take place. The objection that we are doing more for the tuberculous subject than for the healthy man must not make us wait until the housing and unemployment problems are solved before proceeding further. Only by helping fully the stricken in this generation can we hope to save the next generation; and we have been taught that our mission is to the sick rather than to them that are whole. The problem is similar to that which is dealt with by the Prisoners' Aid Societies; for the sake of the community as a whole, as well as for the sake of individuals, most of us believe that a full helping hand should be given to the ex-prisoner, even if it be occasionally or often abused. So should it be for the consumptive.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

Borough of Macclesfield.

THE first report on the year 1929 to reach us is that for the borough of Macclesfield, prepared by Dr. Margaret Dillon-Leetch, medical superintendent of the isolation hospitals and school medical officer, who was appointed temporary medical officer of health after the death of Dr. J. Hedley Marsh in June.

The estimated population of the borough in 1929 was 34,000; birth-rate, 13·9. Death-rates per 1000 of the population: all causes, 15·9 (standardised, 14·6); tuberculosis, 0·65; cancer, 1·53; respiratory diseases with influenza, 4·2; heart disease, 2·2. Death-rates per 1000 live births: neonatal, 30; infant, 78; young child (1–5 years), 42; maternal from childbirth, 8·4. The registered stillbirths numbered 31, equivalent to 6·5 per cent. of the live births. These figures may be compared with the provisional rates for the 157 smaller towns given by the Registrar-General: births, 16·0; deaths, 12·3, and infant mortality 69 (see THE LANCET, Jan. 25th, p. 195); and with the provisional rates for England and Wales: tuberculosis, 0·96; cancer, 1·43; and maternal mortality from childbirth, 4·33 (see THE LANCET, March 29th, p. 700). Dr. Dillon-Leetch points out, as did the Registrar-General in giving his provisional figures, the adverse effect on the statistics of the epidemic of influenza and the very severe weather experienced during the first quarter of the year. Thus in Macclesfield out of a total of 542 deaths, 253 occurred during the first quarter, February claiming 134 and March 119; whilst influenza and respiratory diseases accounted for 92 more deaths than in the previous year. The four deaths which made up the maternal rate of 8·4 were all due to "other accidents and diseases of pregnancy and parturition"; but Dr. Dillon-Leetch points out that one of the two cases of puerperal fever notified developed pneumonia, was admitted to the General Infirmary, and died.

The Public Health Society reports in appreciative terms on the good work done by the day nursery for children under five years, the attendances for which numbered 5847 for the whole day and 834 for the half day; 83 mothers received domiciliary prenatal advice, and the total births numbered 473. The two centres give systematic instruction in housewifery to mothers, and receive much assistance from voluntary helpers. The local authority does not employ or subsidise any of the nine midwives practising in the area. The guardians' hospital has been fitted with a maternity ward, and a scale of fees

arranged for private patients, and the maternity and child welfare committee assist in defraying the cost of the confinement of poor mothers in this ward. Out of 24 samples of milk examined biologically, one, produced in the rural area outside the borough, was found to contain tubercle bacilli, and the veterinary examination of the dairy herd was being carried out at the end of the year. In addition three milch cows were reported under the Tuberculosis Order, two being found post mortem slightly affected, and the other in a fairly advanced stage of the disease. Five prosecutions were undertaken for added water in milk; two were successful but three, where the percentage of added water was given as 9·4, 5·6, and 5·8 respectively, were dismissed on payment of costs. In the case of two of the monthly examinations of the water-supply the public analyst reported that in his opinion chlorination had not been carried sufficiently far.

The closets have nearly all been converted to the water-carriage system, the accommodation being, at present: clean water-closets 8474, waste water-closets 264, pail-closets 19, and privies 94. Town-planning work has been taken over by the East Cheshire Town Planning Committee. The new houses erected numbered 129, 108 of which were State-aided, 74 being municipal. There are 17 slaughter-houses in constant use, ten being registered and seven licensed; and the Health Committee rejected an application for the erection of a new one.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 12TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox 423 (last week 457); scarlet fever, 2226; diphtheria, 1432; enteric fever, 85; pneumonia, 1296; puerperal fever, 68; puerperal pyrexia, 107; cerebro-spinal fever, 15; acute poliomyelitis, 2; acute polio-encephalitis, 3; enteric fever, 13; typhus fever, 1; dysentery, 5; ophthalmia neonatorum, 123. No case of cholera or plague was notified during the week.

The case of typhus was the second within a fortnight to be notified in the metropolitan borough of Shoreditch, but on inquiry at the Western Fever Hospital—to which, as we reported last week, the mother and daughter were admitted for observation—we learn that their infection proves to be glandular fever (infectious mononucleosis). A niece of the elder patient is in St. Bartholomew's Hospital suffering from the same condition.

The number of cases in the infectious hospitals of the Metropolitan Asylums Board on April 15th–16th was as follows: Small-pox, 560 under treatment, 31 under observation (last week 582 and 23 respectively), scarlet fever, 2105; diphtheria, 2785; enteric fever, 27; measles, 1067; whooping-cough, 65; puerperal fever, 29 (plus 17 babies); encephalitis lethargica, 120; poliomyelitis, 2; "other diseases," 25. At St. Margaret's Hospital there were 17 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were 2 deaths from small-pox, 4 (1) from enteric fever, 122 (63) from measles, 10 (5) from scarlet fever, 42 (4) from whooping-cough, 43 (8) from diphtheria, 44 (11) from diarrhœa and enteritis under two years, and 60 (9) from influenza. The figures in parentheses are those for London itself.

The deaths provisionally classified to small-pox were assigned to Camberwell (Met. Boro.) and Leeds. The deaths from enteric fever outside London were reported from West Ham, Plymouth, and Leicester. Fatal cases of measles were widely distributed with larger numbers at Salford, 11; and Manchester, 6. (Glasgow reported 10.) Whooping-cough claimed 5 victims each at Birmingham, Liverpool, and Manchester. Diarrhœa accounted for 6 deaths at Liverpool, 4 at Birmingham. No more than 3 deaths were attributed to influenza in any large town.

The number of stillbirths notified during the week was 301 (corresponding to a rate of 41 per 1000 births), including 70 in London.

FATAL CASES OF SMALL-POX.

The fatal case of small-pox reported in last week's return from the metropolitan borough of Stepney was that of a woman of 66, the widow of a dock labourer, who had been for many years an inmate of the South Grove Institution. The disease began on March 22nd; the rash appeared on the 25th, when she was removed to the Joyce Green Hospital, where she died on April 2nd. We learn from Dr. J. M. Browne, acting medical officer of health, that the death certificate was filled up thus: 1. (*a*) Heart failure; (*b*) card. vasc. degen. 2. Small-pox (vacc. in infancy); no P.M.

AUSTRALASIA.

(FROM OUR OWN CORRESPONDENT.)

Training of Crippled Children.

THE Rotary Club of Sydney adopted as its major activity for 1928–29 the educational and vocational training of crippled children. A committee was formed to make a survey of the Sydney metropolitan area to ascertain the number of crippled children and to arrange for clinics. Their inquiry showed a definite need and justification for such work. While skilful orthopædic surgeons were available, and hospital facilities, the educational opportunities were woefully lacking. The proper sequence, it was agreed, was first to locate the crippled child and lodge him in appropriate quarters; then to provide proper medical and surgical attention, and only after this to adopt any comprehensive educational measures such as vocational training. It was estimated that two or three thousand crippled children would be found in Sydney's population of roughly one million, and that 625 of these would require hospital care. In making recommendations the committee laid stress on the importance of avoiding any disturbance of the relations between the private physician and his patients. "It is unfair, unwise, and unethical," they say, "to embark upon any activity which fails to fully recognise the importance of proper measures to protect the incomes and livelihoods of the medical men concerned."

The New South Wales Society for Crippled Children has now been formed to carry on the work started by the Rotary Club, and has formally taken over the funds, record books, office staff, and equipment of the Crippled Children's Service Committee. Clinics have been established for advising patients whether treatment is likely to be of service, and for directing them to the best means of obtaining treatment. They do not carry out treatment themselves, recognising that the existing services are able to cope with all cases.

Post-graduate Work in Sydney.

Post-graduate instruction in Sydney has hitherto been wholly inadequate. Occasionally courses have been given by various bodies, but no systematic organisation has been attempted. In Melbourne a special post-graduate committee has been conducting courses for some years with great success, and has each year invited over-seas lecturers to give courses on special subjects. The activity and success of the Melbourne committee has been in marked contrast to the apathy in Sydney. The New South Wales branch of the British Medical Association has now taken steps to remedy this unsatisfactory state of affairs, and has formed a Post-graduate Work Committee. A general revision course for country practitioners is to begin on May 24th, and it is hoped that courses in special subjects can be arranged.

Man-eating Sharks.

Not long ago a young man bathing off Middle Brighton Pier at Melbourne was carried off by a shark, and his fate has led to an investigation of protective measures by the Surf Life-saving Association. At Melbourne this is the first death of the kind since 1876. Bathing in Tasmania is said to be free from all risk; in Sydney, on the other hand, there have been accidents of the kind sporadically every

season, and they are also reported from Queensland. Considering the millions of bathers who throng the various surfing beaches each summer, the risk to any individual is infinitesimal, but in certain places it has been thought worth while to build shark-proof fences on the beaches. Whilst harbour bathing has always been known to be dangerous on account of sharks, it is only within comparatively recent years that bathers on the surfing beaches have been attacked.

Not very much is yet known of the habits of the man-eating sharks. Recently a company has been formed known as the Marine Industry Limited, for the purpose of catching sharks and treating them for commercial purposes, and there is no doubt that its work will considerably add to our knowledge of the types of shark present, their location, and their habits.

This company has been operating in the Port Stephens district, and has found that the following sharks are the most common in their order of prevalence: the whaler (*Carcharhinus macrurus*), the grey nurse (*Carcharias arenarius*), the tiger shark (*Galeocerdo arcticus*), and the white shark (*Carcharodon carcharias*). Actually the shark most often caught is the Port Jackson shark (*Heterodontus philippi* and *Gyropleurodus galeatus*), whilst carpet sharks (*Orectolobus devisi*) and wobbegongs (*O. maculatus*) are almost as prevalent as the grey nurse.[1] The Port Jackson, the wobbegong, and carpet shark and also the seven-gilled shark (*Notorhynchus pectorosus*) are not regarded as man-eaters. The whaler, grey nurse, tiger shark, the white shark, and also the hammer-headed shark (*Sphyrna zygæna*) and blue-pointer (*Isurus glaucus*) are all held to be dangerous to man. It is interesting to note that shark attacks are unknown in American waters, although the white shark, the hammer-headed shark, and a species closely allied to the Australian grey nurse, occur there.

There is some difficulty in getting correct information about the type of shark concerned in any particular accident, owing to the rapid movements and the absence of competent observers. Attacks appear to be more frequent in the early morning and late afternoon, and particularly on dull days. It has been stated that mating time is the dangerous period—i.e., about February and March. Lone bathers are particularly liable to attack. As a rule the victim is brought ashore, but even then the death-rate from shark-bite is very high. The wounds are of two kinds—those actually caused by the bite, and others caused probably by the impact of the body and the fins. Most of the wounds have been on the legs; either the foot and part of the leg has been completely severed, or large parts of the thigh or buttock have been bitten off. Some idea of the power of the bite can be gained from a case in which a large portion was removed from the loin at the level of the crest of the ilium; part of this bone was taken in the bite, the bone being removed flush with the soft parts. The hand and forearm have been taken off, but this does not often happen. Bites actually on the body are uncommon on those admitted to hospital. Of those bitten, many die very rapidly from hæmorrhage, and those who survive this generally die either from shock or gas gangrene. In almost all those who have recovered, the bite has been on a limb which has required amputation later. Amputation of the limb or complete excision of the site, where amputation is not possible, seems to offer the best chance of recovery.

It has been suggested that the patient should be kept at the beach casualty room, until shock has been treated, before removal to hospital. This presents many difficulties, and the Surf Life-saving Association holds that expert medical and nursing attention in hospital should be secured as soon as hæmorrhage has been dealt with. This should be done at the water's edge, and the patient should be transferred to hospital as soon as his condition will allow of it. The hospital should be previously notified so that immediate arrangements can be made for blood transfusion.

[1] Roughley, T. C.: Austral. Museum Magazine, 1928, iii., p. 5.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

An Epidemic of Trichinosis.

AN outbreak of trichinosis in Stuttgart, Würtemberg, has been traced to bear's ham served to the guests of a restaurant. The ham was that of a polar bear belonging to a small circus which did not prosper and was therefore dissolved. The proprietor of the restaurant bought the bear, which was apparently sound, and put bear's ham on the bill of fare. The meat was very much enjoyed by his clients, but those who had eaten of it complained some time afterwards of severe muscular pain; fever developed and they had to be taken to hospital, where the nature of the disease was eventually ascertained. Eventually more than 70 people were taken ill, and ten of them died, including the proprietor of the restaurant and his wife. There is some astonishment among the public that it is possible to have such an epidemic of trichinosis, which has almost disappeared in Germany as a result of the careful meat inspection. It is stated, however, that there is a gap in the law, in that game is not liable to examination, and the proprietor of the restaurant was thus within his rights to sell the meat without inspection. According to veterinarians bears often suffer from trichinosis, and though the flesh of these animals is very seldom eaten in this country, meat inspection should be extended to it.

Medical Education.

The Berlin Medical Chamber has been discussing the reform of medical study and of medical examinations. This subject is of interest to medical men in general, since the overcrowding of the profession is partly due to the unsatisfactory system of examination. Dr. His, professor of clinical medicine and head of the first medical clinic of the university, said he thought medical students should have enough knowledge of Latin to enable them to understand the terms which are international and have partly been used for centuries. Formerly only students coming from a public school where Latin and Greek are taught were admitted to medical study, but for some time pupils of schools without classical instruction have been able to matriculate as medical students. Prof. His also spoke against the proposal to separate medical study from the university, and set up special medical schools. Examination and study, he said, should be arranged according to the requirements of general practice and special training should be reserved for the period of assistantship after qualification. Medicine, surgery, and obstetrics should be the nucleus of study and examination, and time should be devoted to the study of special branches only so far as they are of use to the general practitioner. The medical students should be trained in nursing too. In the first term he should be taught physics, chemistry, and biology, but in separate courses and not alongside students of chemistry and physics whose instruction is, of course, to be more extensive. An examination will follow, and if a student shows that he has no gift for natural science he should not be allowed to go on with his studies. After the second term an examination in anatomy and in physiology should be held, with similar consequences, and after this second examination seven terms of clinical study should follow. During the university vacations medical students should work as dressers and clinical clerks, and the year's practical work in hospital should be passed before and not (as hitherto) after, the final examination. In this way the examiner would be in a position to say whether the candidate had a practical and not only a theoretical knowledge of medicine.

Inguinal Lymphogranulomatosis.

Dr. Frey lately read a paper before the Berlin Medical Society on lymphogranulomatosis as a venereal disease. The symptoms, he said, are a torpid swelling of the inguinal glands, taking origin

from an erosion of the genitals. The venereal nature of the disease is proved by the fact that infection is often caused by sexual intercourse, the partner showing the same symptoms some time later. The diagnosis, according to Frey, is established by cutaneous reaction produced by attenuated bubonic pus as antigen. For the treatment antimonial preparations are recommended.

An Institute of Radiological Research.

An institute of radiological research has been opened in Berlin in connexion with the medical faculty of the university. The head of the new institution is Prof. Friedrich, who, at the same time, has been appointed ordinary professor of medical physics in the university. The premises were opened in the presence of the Minister for Education, who said that the Government intend also to set up an institute of radiotherapy, and that this would be done as soon as the necessary funds were available. The buildings include a physical department with the most modern rontgen and high-frequency apparatus, a biological and a chemical department, a lecture room, and a laboratory for testing radium preparations used in public hospitals.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Recuperated Bath Water.

THE conduct of a thermal establishment at the popular resort of St. Nectaire has been the subject of legal investigation. The place was bought some years ago by a Dutchman named Van Gerdinge, who with his family undertook its whole management. Some time later it was rumoured that the bathing plant had been reconstructed by the new owner so as to heat up again the bath water used by previous bathers, an economical arrangement which did not conform to the precise requirements of modern hygiene. On inquiry the police found a secret plant for re-heating the bath water, and the proprietor and his son were tried last week at the local police-court and sentenced to three months' imprisonment with an additional fine of about £1500. Compensation was awarded to the victimised clients to an amount varying between £12 and £90 each. An expert has been nominated by the Court to assess the amount of indemnity payable to the health resort.

Social Insurance.

Deputies being now quit of the Budget have set to work on the social insurance law. Both Chambers are due to rise shortly, and it is not quite certain that the law will have passed all its stages by the first of July, the date promised when the measure was postponed last January. The desired concessions to professional ethics have been made on all points in deference to pressure from the leaders of the profession.

An X Ray Martyr.

Dr. Robert Chaperon has died in Paris after a long illness occasioned by professonal exposure to X rays at the Hôpital Broussais, where he was radiologist and assistant in electroradiology to Dr. Laubry. Two days before his death he was visited by the new Minister of Public Health, accompanied by members of the hospital staff, who conferred on him the gold medal of the Assistance Publique. It is understood that his memory will carry the insignia of the Legion of Honour which was not awarded to him in his lifetime.

ENLARGEMENT OF BROOK HOSPITAL.—This transferred hospital at Shooters Hill, Woolwich, is to be enlarged by the London County Council at a cost of £50,000, one-half of which will be absorbed by a nurses' home. When this hospital is full 227 nurses will be required.

Correspondence.

"Audi alteram partem."

A UNIVERSITY DEGREE FOR THE GENERAL PRACTITIONER.

To the Editor of THE LANCET.

SIR,—General practitioners of the British Empire will welcome the practical results of the findings of the Post-graduate Medical Education Committee. It must surely be fully realised that the main object of the medical student is to get through his examinations. Those who can afford it—for the cost of the medical curriculum is, speaking generally, a severe strain of the finances of parents—may be able to spend further time and money in obtaining higher qualifications, but everyone is aware that at the time of qualification one knows very little, if anything, of practical medicine. It is only when one encounters practical problems, after qualification, that one begins to learn medicine in its various branches. This fact, although sufficiently obvious, has not been fully appreciated by the authorities, and concentration on the encouragement of practitioners—who after all, are treating the great proportion of the sick population—will result in the greatest benefit to medicine as a whole.

Registered medical practitioners will therefore welcome with pleasure the fact that the Ministry of Health is seeking, in addition to other great authorities, the support of the University of London and will rejoice that, at last, the case of the general practitioner is beginning to be considered, and the importance of encouraging his further education is being realised. In this scheme the University of London can, if it so desires, play a unique and important part in encouraging practitioners to continue to be students of medicine. It can, in a broad and tolerant spirit—by granting an M.D. Degree to registered medical practitioners of the British Empire of approved standing—i.e., those who have contributed, e.g., in their field of general practice, to clinical research, and who are of, let us say, at least ten years standing, and who have, after a course of study at the post-graduate medical school, passed a required examination suitable for a general practitioner—do much to make the post-graduate hospital a medical metropolis of the British Empire, and encourage practitioners to continue to remain students of medicine.

In this way the University of London can share in the scheme and feel that it is—by granting its degree to a registered medical practitioner of approved professional standing and attainments who has studied in its post-graduate medical school— assisting practically and in a peculiar way, in the encouragement of post-graduate medical study by general practitioners.—I am, Sir, yours faithfully,

April 16th, 1930. M.D., M.R.C.P.

DISTRIBUTION OF TYPHUS VIRUS IN THE BLOOD.

To the Editor of THE LANCET.

SIR,—In a recent issue you called attention to the important section in the report of the Medical Research Council dealing with the virus diseases. On p. 19 of that report it is stated that it was shown, before the war, that the virus of typhus does not float freely in the blood, but is contained in the white corpuscles. That was the conclusion originally arrived at by Nicolle, but it does not hold now. It was shown first by Kusama and subsequently by Bacot and Ségal that the virus is contained not in the leucocytes but in the blood-platelets. And Bacot, with his brilliant technique, was able to produce the infection of lice per anum with platelets proved by the

subsequent occurrence of the typhus "Rickettsia" bodies in the gut. I am under the impression that Nicolle has since agreed with this determination of the true distribution of the virus in the blood. It is important to point out the above fact, not only in justice to the late Mr. Bacot's work, but because of its significant bearing in relation to the pathology and ætiology of the disease. Typhus is particularly a derangement of the reticulo-endothelial system, and it is from certain cells with this ancestry (megakaryocytes and monocytes), both of which are macrophagic, that the platelets are produced.

Incidentally, there is another rather misleading statement on the same page. Dealing with Dr. Andrewes's work on the in-vitro "cultivation" of a virus, the report says: "It can be proved that in a cultivation of this kind, the virus actually multiplies itself." That is, to my mind, exactly what has not been proved. As I pointed out in a recent letter to your columns (Jan. 25th, p. 211), the increase of a virus in tissue-cell "cultures" is by no means the same thing as multiplication, because there is the probability that the additional quantity of virus is produced by the living cells themselves and not actually by the virus, which is to be regarded—again, I say, most probably—as non-living and of the nature of an abnormal blood-digestive enzyme. Convinced as I myself am, from my studies of the nature of various inclusions, of the general truth of this theory, I have never said it is proved. Progress in science is hampered by saying that a thing is proved when such is not the case.

I am, Sir, yours faithfully,

April 16th, 1930. H. M. WOODCOCK.

A MANUAL OF FEVERS IN INDIA.

To the Editor of THE LANCET.

SIR,—In the issue of THE LANCET for Jan. 25th I notice a review of my book "Infectious Diseases and Other Fevers in India." I find that it is no review at all, and instead of pointing out whether the book is useful or not for whom it is intended, your reviewer starts criticising the whole material in an unfair spirit, setting out only the defects. Also he should realise that the book is not meant for himself or his like, and students in Great Britain, but is meant for our students and practitioners here. The discussion of yellow fever is included at length because of the ever-present danger of its being introduced in India after the construction of the Panama Canal, and it is frequently mentioned by the Government for their special works, such as the ruinous Back Bay reclamation, so as to provide isolation space. Also we have got in this hospital a special screened ward kept reserved for it. It is from this point of view, as well as from the similarity of the preventive measures (which form the main bulk of that chapter) to those of malaria (as regards mosquitoes), the most common type of fever prevailing in this country, that so many pages are devoted to it rather than to undulant fever, which is hardly noticed in this country. As a matter of fact it is by mistake only that my book was sent by the publishers to reviewers outside India, as we know that our point of view will never be considered by the people abroad, and specially in England.

I am, Sir, yours faithfully,

P. T. PATEL, M.D., M.R.C.P. Lond.,
Medical Superintendent, City Isolation
March 8th, 1930. Hospitals, Bombay, India.

HIGHLANDS AND ISLANDS MEDICAL SERVICE.

To the Editor of THE LANCET.

SIR,—Owing to the exhaustion of the Highlands and Islands (Medical Service) Fund, Parliament recently authorised an increase to the previous inadequate Treasury grant in order that the recommendations of the report of the Dewar Commission of 1912 may be carried out. One of the most important recommendations of that report was the institution of a contributory superannuation scheme for the medical officers of the above Service in the poor and remote single-practice areas where income from private practice is negligible and the medical officer's work is almost altogether national work. It is said that the late Board of Health had such a scheme considered, but that at the time the scheme, for financial reasons, could not be put into force. It is to be hoped, now the financial conditions are adequate, that a satisfactory scheme for superannuation of the medical officers will be granted by the Department in the interest of this essential medical service.

I am, Sir, yours faithfully,

April 23rd, 1930. VIATOR.

Obituary.

FRANCIS LEY AUGUSTUS GREAVES, O.B.E., F.R.C.S. ENG.

Mr. Frank Greaves had recently tried to curtail some of his professional activities on account of his health, but the news of his death on April 16th came as a shock to a wide circle of friends and medical colleagues. He was actively engaged in hospital and consulting practice until a few weeks ago.

Born at Derby 55 years ago, he was the son of a medical man, Dr. C. A. Greaves, who held the post of honorary physician to the Derbyshire Royal Infirmary. He entered St. Thomas's Hospital, and after a distinguished career as a student qualified as M.R.C.S. in 1897, and was appointed house surgeon. In 1898 he became assistant house surgeon, and in the following year house surgeon to the Derbyshire Royal Infirmary, which institution he was still serving at the time of his death. In 1902 he obtained the Fellowship of the Royal College of Surgeons and was appointed honorary surgeon to the Infirmary. Three years later he inaugurated the ear, throat, and nose department, acting as honorary surgeon in this specialty, and also as honorary surgeon in the general surgical departments. As an officer in the Territorial Force he went on active service at the outset of the war; and later his surgical abilities were fully employed as acting lieut.-colonel in charge of surgical divisions of the 26th and 74th General Hospitals in France.

Apart from his work at the Derbyshire Royal Infirmary, Greaves was consulting aural surgeon to the Derbyshire Hospital for Sick Children and consulting surgeon to the Whitworth Hospital, Darley Dale, and to the Ripley Cottage Hospital. He had a large consulting practice, both as a throat specialist and in general surgery, for more than twenty years, and was held in great esteem by the profession in and around Derby. His hospital work was of a high standard; his outstanding experience being in the surgery of the thyroid gland and the treatment of fractures. He was always an enthusiastic worker for the Derby Medical Society, and his life and work did much for the scientific side of medicine in the locality. At the time of his death he had just finished a year as chairman of the Derbyshire Division of the British Medical Association.

In 1906 Mr. Greaves married Constance May Rice, who, with their son, survives him.

ST. BARTHOLOMEW'S HOSPITAL NEW SURGICAL BLOCK.—This building will probably be completed during May. The ground floor is already finished and equipped, and was last week opened to the inspection of anyone who applies for a ticket. In the male ward there is an exhibition illustrative of the progress of surgery from the earliest times to the present day. Among the exhibits are instruments found at Pompeii, which bear a remarkable resemblance to some of those now in use.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

EASTER ADJOURNMENT.

PARLIAMENT adjourned on Thursday, April 17th, for the Easter Recess. Both Houses will reassemble on Tuesday, April 29th.

HOURS OF INDUSTRIAL EMPLOYMENT BILL.

On April 16th Miss BONDFIELD (Minister of Labour) introduced the Hours of Industrial Employment Bill, a measure "to regulate the hours of work in industrial undertakings." The Bill was read a first time.

HOUSE OF COMMONS.

TUESDAY, APRIL 15TH.

Sanitary Convention and Pilgrim Traffic.

Major GRAHAM POLE asked the Secretary of State for India whether the convention in respect of pilgrim traffic approved by the International Sanitary Conference, held in Paris in 1926, was signed by the representatives of India at the Conference; and whether it was the intention of the Government of India eventually to ratify this convention.—Mr. WEDGWOOD BENN replied: Yes, Sir. The International Sanitary Convention of 1926 which contained, inter alia, provisions regulating the pilgrim traffic, was signed by a representative of India but has not yet been ratified. The Government of India hope to reach a decision shortly.

Boy Workers in Coal-mines.

Mr. FREEMAN asked the Secretary for Mines how many boys under 16 were working down mines at the present day; and if he contemplated any action in the matter.—Mr. BEN TURNER replied: The number of boys under 16 years of age employed below ground in coal-mines in December, 1929, was about 29,000. With regard to the second part of the question, there is no present intention of introducing legislation on this subject.

Insured Persons and Sickness Benefit.

Sir FREDERICK HALL asked the Minister of Health the numbers of insured men per 100 who claimed sickness benefit in 1921 and 1927, respectively; the respective expenditure in the same two years for sickness and disablement benefits and the State treatment of disease; the cost per head of the population of England and Wales in 1921 and 1927, respectively, for national health insurance; the cost per head of that population for the same years for State medical treatment; whether the tendency was for expenditure on sickness benefit to decrease as expenditure on preventive and curative treatment increased; and if he would consider setting up a suitable body to inquire into the working of the Health Insurance Acts.—Miss SUSAN LAWRENCE (Parliamentary Secretary to the Minister of Health) replied: The information desired by the hon. Member is as follows: (1) According to a report recently furnished by the Government Actuary of the sickness and disablement benefit experience of a representative sample of the whole body of insured persons, the number of insured men per 100 who claimed sickness benefit in 1921 and 1927 was 14 and 23 respectively. (2) The amounts expended under the Health Insurance Acts in England and Wales in 1921 and 1927 in respect of (*a*) sickness benefit were £7,176,800 and £11,818,000 respectively; (*b*) disablement benefit were £2,689,600 and £6,368,000 respectively; (*c*) medical benefit were £9,394,800 and £8,772,500 respectively. In this connexion it is pointed out that the increase in the amounts expended on sickness and disablement benefits in 1927 as compared with the corresponding amounts expended in 1921, was to some extent due to the fact that in the later of those years there were larger increases in the benefit rates under the Societies schemes of additional benefits. (3) The cost per head of the population of England and Wales in 1921 and 1927 for national health insurance was 13*s.* 11*d.* and 18*s.* 8*d.* respectively, and of medical benefit provided under the Health Insurance Acts, 4*s.* 11½*d.* and 4*s.* 5½*d.* respectively. As regards the last two parts of the question I would refer to the reply given to Sir Kingsley Wood on April 10th. The factors which have contributed to the increases above noted are numerous and complex, and without further and fuller consideration my right hon. friend does not think it possible to make any general statement as to the relation between those facts and the increased provision of curative and preventive treatment to which the hon. Member refers.

Courses at Royal Naval Medical School, Greenwich.

Dr. VERNON DAVIES asked the First Lord of the Admiralty the number of courses provided at the Royal Naval Medical School, Greenwich; the maximum number of students which could be taught at each course; the number of entries for each course; the total cost of such courses for each of the last three years for which statistics were available; and the total amount of vaccine produced and distributed yearly during the same period.—Mr. AMMON (Parliamentary Secretary to the Admiralty) replied: There would normally be two courses a year at the Royal Naval Medical School Greenwich, for acting surgeon lieutenants, but these are at present in abeyance. There are also normally two courses a year for surgeon lieutenant commanders. The maximum number of students who can be trained at any one time at the school is 12 officers and 12 ratings. The numbers who attended courses during the period 1927–29 are as follows:—

Officers.—1927, 5*; 1928, 6*; 1929, 7*.
Ratings.—1927, 4*; 1928, 1; 1929, 5.

* Includes one from Royal Australian Navy in each case.

When the shortage of naval medical officers is overcome the numbers attending will approximate to the following figures annually: acting surgeon lieutenants (two courses) 24; surgeon lieutenant commanders (two courses), 24. The approximate amounts included in the estimates for the Royal Naval College, Greenwich, which can be attributed to the medical school are as follows: 1928, £9650; 1929 £9800; 1930, £9800. These amounts represent the cos not only of the above-mentioned courses of instruction for which separate figures are not available, but also of very large amount of highly technical work of the greates importance to the health of the Navy. To enumerat some of this latter work, mention should be made of researc work, analytical work of great variety, tropical diseas investigations, special pathological examinations, &c and lastly the very important work of vaccine making The total amounts of vaccine produced and distribute yearly during the last three years are as follows: 192 102,360 c.cm.; 1928, 95,060 c.cm.; 1929, 102,830 c.cm.

British Post-graduate Hospital and Medical School.

Mr. MATTERS asked the Minister of Health whether, i connexion with the British Post-graduate Hospital an Medical School, facilities would be provided whereb foreign medical men and women might secure a British pos graduate degree supplementary to, and based on recognitio of, the diplomas secured by them in their own countries.— Mr. GREENWOOD replied: The question of the grant medical degrees is not one which it rests with the Minist of Health to determine; and consideration of the matt in the present connexion would appear to be prematu pending the establishment of the British Post-gradua Hospital and Medical School.

Sanitary Conditions in the Hop Districts.

Sir BASIL PETO asked the Minister of Health how ma local authorities had improved their code of by-laws duri the previous two years with reference to the sanitary cond tions that existed through the hop-picking season; ar whether any further improvements had been suggested h his department to local authorities for the forthcomi season.—Mr. GREENWOOD replied: Since the beginning 1928 16 local authorities have made new series of by-la on this subject. In nine cases the by-laws amended tho formerly in force and in the remaining seven no by-la had previously been made. The question whether ar further suggestions can be made for the improvement conditions during the forthcoming season is receiving n consideration.

Hospital Accommodation for Becontree.

Mr. MARCH asked the Minister of Health if he was awa that a public appeal was being made for funds to erect hospital to meet the needs of the new residential centre Becontree created by the London County Council; ar would he in future, when sanctioning housing schemes, ta into consideration the hospital accommodation in or ne the area of the housing scheme.—Mr. GREENWOOD replie The answer to the first part of the question is in the affirm tive. It is only in quite exceptional cases such as th mentioned by my hon. friend that the transference population involved in a housing scheme would be such to make it necessary to give special consideration to t hospital accommodation in or near the area of the schem but the point will not be overlooked in any comparable cas

WEDNESDAY, APRIL 16TH.

Rejection of Army Recruits on Medical Grounds.

Major GLYN asked the Secretary of State for War t percentages of men offering themselves for enlistment in t

Army and who were rejected on the main physical defects falling into the eight different categories; and how these percentages compare with those of the four years 1920 to 1924 and for the four years prior to the war.—Mr. T. SHAW replied: The ratio per 1000 candidates for enlistment rejected by the examining medical officers for the following physical defects was as follows:—

Disability.—A = Diseases of middle ear. B = Loss or decay of many teeth. C = Defects of Lower Extremities. D = Defective vision. E = Diseases of the Heart. F = Insufficient weight. G = Flat feet. H = Under chest measurement.

—	1910	1911	1912	1913	1921	1922	1923	1924	1929
A ..	6·35	6·58	7·25	8·26	11·71	15·53	24·73	31·65	50·21
B ..	56·95	26·05	22·44	21·08	35·16	49·98	48·49	36·13	26·13
C ..	18·74	20·05	15·59	12·01	11·58	17·40	29·13	33·86	33·73
D ..	18·15	21·07	21·08	21·97	58·39	52·50	38·94	30·54	26·69
E ..	40·38	41·24	37·01	28·67	37·87	32·38	44·84	53·42	43·56
F ..	5·34	8·07	3·62	10·21	11·89	9·85	10·73	22·69	24·50
G ..	10·44	8·12	7·30	5·49	27·22	26·99	27·44	23·17	16·90
H ..	43·97	30·47	29·23	18·03	33·39	47·49	28·92	20·85	10·58

Salaries of Coroners.

Mr. EBENEZER EDWARDS asked the Home Secretary the salary and emoluments of the coroners in Northumberland and the city of Newcastle-on-Tyne.—Mr. SHORT replied: The coroners in question are remunerated by salary only. As their salaries may be fixed by agreement my right hon. friend is not always in possession of the current figures. The amounts in 1929 were: Northern District, £300; Southern District, £600; Berwick-on-Tweed Borough, £50; Newcastle-on-Tyne County Borough, £850.

Psittacosis.

Mr. WEST RUSSELL asked the Minister of Health the number of cases of psittacosis reported during the present year; the number of these which had been fatal; and whether he was satisfied that adequate steps had been taken to deal with this matter.—Miss S. LAWRENCE replied: Information has been received in the Ministry of Health of 80 cases of illness which commenced during the present year and in which the patients had been associated with sick parrots. Thirteen of these cases proved fatal. It is not possible for my right hon friend to say definitely how many of these persons were, in fact, suffering from psittacosis, but in nine of the fatal cases psittacosis appeared on the death certificate as a cause of death. The answer to the last part of the question is in the affirmative.

THURSDAY, APRIL 17TH.

Heating of School Rooms.

Mr. MARJORIBANKS asked the President of the Board of Education whether he had obtained records for consideration as to the effect upon the health and vitality of the children of central heating, open-fire heating, or no heating, respectively, in elementary school rooms.—Sir CHARLES TREVELYAN replied: I have not obtained records on these points, and I should doubt whether they would lead to any modification of the now generally accepted view that, in normal circumstances, some form of central heating is the most suitable system for schools.

Supply of Milk to School-children.

Mr. ROSBOTHAM asked the President of the Board of Education how many scholars in the elementary schools of England and Wales were being supplied daily with milk; if he was satisfied with the reports received as to the benefits derived; and, if so, if he would give every encouragement to local education authorities to extend the system.—Sir CHARLES TREVELYAN replied: The National Milk Publicity Council estimate that about 350,000 school-children are now receiving milk under their schemes. I am not able to say how many children are receiving milk under arrangements made by the local education authorities, but I am taking steps to obtain this information. The reports received as to the benefits derived by the children are very satisfactory. I am anxious to give every encouragement to the extension of the movement in the schools, and I am now considering the most effective means by which I can do so.

Mr. MCSHANE asked whether any grants for this purpose had been made from the Exchequer?

Sir. C. TREVELYAN: Certainly, where the local authorities have spent the money they have got the grant.

Mr. SMITHERS: What steps are being taken to see that this milk is free from tuberculosis?

Sir C. TREVELYAN: I believe the National Milk Publicity Council are very particular about this matter.

Mr. FREEMAN: Is the right hon. gentleman in favour of every child having this daily supply of milk?

Sir C. TREVELYAN: I should be very glad to see it.

Milk and Tuberculosis.

Mr. SMITHERS asked the Minister of Health what progress was being made to ensure that milk supplied to the public should be free from tuberculosis; if he had consulted members of the medical and veterinary professions; what other inquiries he had made; and briefly the present position and what further action he proposed to take.—Mr. GREENWOOD replied: I understand that an increasing number of local authorities are carrying out regular veterinary inspections of cattle and having samples of milk tested for tubercle bacillus, with a view to the exercise of their powers under the Milk and Dairies Act. I am not proposing to introduce any further legislation on this subject at the present time, but I am in consultation with my right hon. friend, the Minister of Agriculture and Fisheries, with a view to the issue of a circular to local authorities indicating the further steps which they might advantageously take under existing powers. For this purpose I shall, of course, have regard to the views of the medical and veterinary advisers of the two departments, as well as those of other members of the two professions who have communicated with my right hon. friend and myself.

Mr. SMITHERS: In view of the national importance of getting the milk-supply free from tuberculosis, especially for the children in school, will the right hon. gentleman take steps to speed up this inquiry and to ensure that the milk supplied should, as far as possible, be free from tuberculosis?

Mr. GREENWOOD: I hope the circular will be issued to local authorities very shortly.

Liquid and Dried Eggs from China.

Mr. RAMSBOTHAM asked the Minister of Health whether he was satisfied that the imports of liquid and dried eggs from China were free from contamination and without danger to public health; what was the value of such eggs annually imported in these two forms; and for what purposes they were chiefly used.—Mr. GREENWOOD replied: So far as I am aware these imports are free from contamination and if they arrive in good condition are without danger to the public health. They are required to be free from preservatives, and in common with other imported foods they are subject to inspection at the port of entry and may be seized and destroyed if they are found to be unsound, unwholesome, or unfit for human consumption. The value of such eggs imported from China during the year 1929 was £3,574,640. I understand that these eggs are mainly used by the baking trade for cake-making.

Sewage Disposal in Mitcham District.

Mr. MELLER asked the Minister of Health whether he was aware of the inadequate provision made for the disposal of sewage in the districts of Mitcham, Beddington, and Wallington, and Merton and Morden, inasmuch as the present works were only capable of dealing with a population of 80,000, whereas the population was now approximately 115,000 and was rapidly increasing, particularly in the district of Merton and Morden which contained a part of the St. Heliers estate; that a scheme to enlarge the works had been under consideration by the Ministry since June last and was still awaiting sanction; if he could give reasons for the delay and see that steps were immediately taken to safeguard the health of the districts affected.—Mr. GREENWOOD replied: I am aware of the need for improvement of the arrangements for disposing of the sewage of the districts in question, and I have under consideration a scheme for this purpose, the estimated cost of which is £174,000. In view, however, of the inquiry which is now proceeding into the whole question of sewerage and sewage disposal for the Greater London area, the present scheme must be regarded as part of a larger problem, and I am anxious that no expenditure on works at the present site should be incurred which can be avoided by the substitution of alternative arrangements to those submitted. My decision is, therefore, being deferred pending the result of further investigations. I am not aware that there is danger to health, but the hon. Member can rest assured that there will not be any avoidable delay in dealing with this difficult problem.

Hours of Industrial Employment Bill.

Mr. TOUT asked the Minister of Labour whether the Hours of Industrial Employment Bill would enable the Washington Hours' Convention to be ratified.—Miss BONDFIELD replied: The Hours of Industrial Employment Bill does not apply to underground workers in coal-mines, whose hours are the subject of another Bill now before Parliament. As regards all other workers covered by the Washington Hours Convention I am advised that the Hours Bill fulfils the requirements of the Convention.

Treatment of Tuberculosis in Kent.

Captain BALFOUR asked the Minister of Health the number of beds available in the county council of Kent institutions

for pulmonary tuberculosis; the number of patients awaiting admission for this disease on Jan. 1st, Feb. 1st, and March 1st, 1930; if the proportion of waiting subjects to available beds was considered satisfactory by the Ministry of Health; and, if not, whether he would take steps to improve this state of affairs.—Mr. GREENWOOD replied: The average number of beds available in 1929–30 under the scheme of the Kent County Council for the treatment of pulmonary tuberculosis was 364, of which 155 were in institutions provided by the county council. The numbers of persons suffering from pulmonary tuberculosis who were awaiting admission to residential institutions were 74, 60, and 72, on Jan. 1st, Feb. 1st, and March 1st respectively, but the number so waiting had been reduced to 50 on April 1st. The proportion which that number bears to the number of available beds is slightly higher than for the country as a whole, but I am informed that the average waiting period in Kent is approximately one month only. I understand that the County Council are giving consideration to this matter, and that they propose, as a temporary measure, to reduce the waiting-list by the use for suitable cases of accommodation in the poor-law institutions which were transferred to them on April 1st.

Medical News.

UNIVERSITY OF LONDON: *University College.*—A course of six lectures on Special Sense Physiology will be given at the College by Dr. R. J. Lythgoe at 5 P.M. on Thursdays and Tuesdays, from May 15th to June 3rd.

UNIVERSITY OF LONDON MEDICAL GRADUATES SOCIETY.—The annual dinner and meeting of this society will be held at the Langham Hotel, Portland-place, W., on Tuesday, May 13th, at 7.30 for 7.45 P.M. The President, Sir StClair Thomson, will be in the chair. Applications for tickets should be sent to the hon. secretaries of the society at 11, Chandos-street, W.1.

ABERDEEN UNIVERSITY CLUB, LONDON.—The eighty-third half-yearly dinner will be held at the Trocadero Restaurant on Thursday, May 15th, with Prof. J. J. R. Macleod, F.R.S., in the chair. Dr. Leonard Hill, F.R.S., will be the guest of the club. The hon. secretary's address is 9, Addison-gardens, W.14.

INDIAN MEDICAL SERVICE DINNER.—The annual dinner of the Indian Medical Service will be held at the Trocadero Restaurant, Piccadilly-circus, London, on Wednesday, June 18th, at 7.15. Major-General F. G. H. Hutchinson has been invited to take the chair. Tickets and all particulars may be had from the joint hon. secretary, Sir Thomas Carey Evans, 31, Wimpole-street, W.1.

BRITISH INSTITUTE OF PHILOSOPHICAL STUDIES.—Six lectures on Æsthetic Philosophy will be given by Prof. Lascelles Abercrombie, beginning on Monday, May 5th, at 5.30 P.M. Particulars may be had from The Director of Studies, 88, Kingsway, London, W.C. 2.

CIVIL SERVICE NURSING AID ASSOCIATION.—At the first annual meeting recently it was reported that more than 2800 persons had applied for membership of this association, that claims under this scheme were already being received, and that a number had been paid.

ROYAL NORTHERN HOSPITAL.—At the annual meeting the Marquess of Northampton stated that the accommodation for out-patients was designed for 40,000 attendances annually, but that now 230,000 have to be dealt with. Remodelling will cost £25,000, but there is already a debt of over £97,000.

LECTURES ON RADIUM.—Dr. John Murdoch, of the Brugmann Hospital, and director of the cancer centre of the University, Brussels, is shortly to visit this country to deliver lectures on radium therapy. At the Medical School, Leeds, at 3.30 P.M. on Wednesday, May 7th, he will give an address entitled: What Can We Expect from Radium in the Treatment of Cancer? Prof. J. F. Dobson will take the chair, and members of the medical profession who wish to attend are asked to inform the British Empire Cancer Campaign, 47, Park-square, Leeds, before May 6th. On Thursday the 8th, at 6 P.M. Dr. Murdoch will give a lecture at the British Institute of Radiology, 32, Welbeck-street, London, on Recent Advances in Radium Therapy, especially in regard to measurement of dosage. Practitioners who are interested are invited to attend. On the following day at 9 P.M. Lord Dawson will preside at a meeting at the Royal Society of Medicine, when Dr. Murdoch will speak on the Radium Treatment of Cancer.

WE regret to announce the death of Dr. F. E. Wynne, Medical Officer of Health for Sheffield and Professor of Public Health in the University.

MIDDLESEX HOSPITAL.—At the annual court of governors recently Prince Arthur of Connaught announced that more than two-thirds of the work of reconstruction has been completed, and that half the patients are back from the annexe and housed in the new west wing. Work will shortly be begun upon the block of 60 separate rooms for paying patients. The Hospital and the Cancer Hospital are to be amalgamated and the old title of the Middlesex Cancer Wing will be resumed.

NATIONAL HOSPITAL, QUEEN-SQUARE. — A post-graduate course on Diseases of the Nervous System will be held at this hospital from May 5th to June 27th. It will consist of lectures and demonstrations at 3.30 P.M. each weekday, except Wednesday and Saturday, with teaching in the out-patient department at 2 P.M. on each weekday except Saturday, and pathological lectures at noon on Mondays. Lectures on the Anatomy and Physiology of the Nervous System (Fridays at noon), and clinical demonstrations chiefly on Methods of Examination of the Nervous System (on Tuesdays and Thursdays at noon), are also being arranged. Application should be made to the Secretary, Medical School, National Hospital, Queen-square, London, W.C. 1.—The average weekly cost per occupied bed (1309 patients) was £3 7*s.* 10*d.*, a reduction of 6*s.* 5*d.* The proposed extensions, to cost £46,000, are to begin within the next two years with the erection of a new pathological department, a surgical wing, and a new home for male nurses.

BIRMINGHAM HOSPITAL CENTRE.—The Lord Mayor of Birmingham has inaugurated an appeal for £1,250,000 for the establishment of the new hospital centre. The late and present Ministers of Health, Mr. Chamberlain and Mr. Greenwood, supported the appeal, and Mr. Amery pointed out that the money could be raised by each citizen of Birmingham giving a penny a week for five years. The city is at least 800 beds short of its needs, and the waiting-lists contain more than 3000 names.

PROGRESS OF CONTRIBUTORY SCHEMES.—Last year the contributory scheme of the Radcliffe Infirmary, Oxford, produced £33,514, an increase of considerably more than £2000.—The income of the Manchester and Salford Hospital Saturday and Convalescent Homes Fund was a fraction over £51,000, nearly double the figure of 1926.—The Salisbury and District Infirmary League raised slightly over £12,000, an increase of about £1000.

LONDON TEMPERANCE HOSPITAL.—On the ground that the great majority of the in-patients come from beyond inner London, the name of this institution has been changed to "The National Temperance Hospital." Last year 1418 patients were treated to a conclusion; they remained on an average 29 days at an average weekly cost of £3 15*s.* 7*d.* The new building, which will cost £35,000, is shortly to be begun, though only £11,000 is available. It is hoped to augment the income by enlarging the private nursing institute.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, April 28th.—8 P.M., ODONTOLOGY. Casual Communications: Mr. F. Coleman: Buried Mandibular Teeth with Crowns in Occlusion. Mrs. May Mellanby: Some Further Investigations on Man and Animals into the Causes of Dental Disease, with Special Reference to Factors Controlling the Resistance of the Dental Tissues to Harmful Agencies.

WEDNESDAY.—8.30 P.M., UROLOGY: Prof. Hugh Young. (Johns Hopkins): The Advantages of the Perineal Route in the Treatment of Various Diseases of the Prostate.

THURSDAY, May 1st.—8 P.M., TROPICAL DISEASES. Election of Officers and Council. Papers: Dr. Aldo Castellani: A Little Known Type of Chronic Colitis. Dr. J. B. Christopherson: Treatment of Bilharzia in Children.

FRIDAY.—10.30 A.M., OTOLOGY. (Cases at 9.30 A.M.) Election of Offices and Council. Papers will be read by Prof. M. Sourdille (Paris) and Mr. G. J. Jenkins. Cases and specimens will be shown by Dr. K. W. Mackenzie and others. 5 P.M., LARYNGOLOGY. (Cases at 4 P.M.) Election of Officers and Council. 8.30 P.M., ANÆSTHETICS. Election of Officers and Council. Short Paper: Dr. R. J. Clausen: Ethylene Anæsthesia. A discussion will follow and Members are invited to relate interesting or instructive cases.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall, S.W.
TUESDAY, April 29th.—5 P.M., Prof. J. J. R. Macleod: Diabetes as a Physiological Problem (First Oliver-Sharpey Lecture).
THURSDAY, May 1st.—5 P.M., Prof. Macleod (Last Oliver-Sharpey Lecture).

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, April 28th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose, and Throat Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY, May 1st.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat, and Ear Clinics. Operations.
FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M., Medical, Surgical, and Children's Diseases Clinics. Operations.
On Thursday, at 4.30 P.M., Dr. F. D. Howitt will give a special lecture on Chronic Rheumatism.

ST. MARY'S HOSPITAL INSTITUTE OF PATHOLOGY, W.
THURSDAY, May 1st.—5 P.M., Prof. John Mellanby: Absorption from the Alimentary Canal.

ST. THOMAS'S HOSPITAL MEDICAL SCHOOL, S.E.
THURSDAY and FRIDAY, May 1st and 2nd.—5.30 P.M., Dr. H. Leslie-Roberts: Some Biological Aspects of the Human Skin.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.
TUESDAY, April 29th.—5 P.M., Mr. R. Christie-Brown: The Causes and Treatment of Delay in the First Stage.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
TUESDAY, April 29th.—4.15 P.M., Dr. E. B. Leech: Ward Experiences of Carcinoma of the Stomach.
FRIDAY, May 2nd.—4.15 P.M., Dr. T. H. Oliver: Demonstration of Medical Cases.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, April 30th—4.15 P.M. (at the Royal Hospital for Sick Children), Dr. Geoffrey Fleming: Medical Cases.

Appointments.

BROWNE, HELEN M., M.B., B.S. Lond., has been appointed Resident Anæsthetist to the Queen Charlotte's Maternity Hospital.

Westminster Hospital Medical School: BIELENKY, D., L.R.C.P. Lond., M.R.C.S., Senior Resident and Casualty Officer; FIRMIN, D. P., L.R.C.P. Lond., M.R.C.S., Resident House Physician; WILLIAMS, A. W., M.B., Ch.B. Camb., Resident House Surgeon; RODGERS, T. S., L.R.C.P. Lond., M.R.C.S., Resident Obstetric Assistant and House Physician to the Children's Department.

Certifying Surgeons under the Factory and Workshop Acts: BISSET, A., M.B., Ch.B. Aberd. (Heywood, Lancaster); and SMALLEY, E., M.B., Ch.B. Edin. (Bury, Lancaster).

Vacancies.

For further information refer to the advertisement columns.

Aylesbury, Royal Buckinghamshire Hospital.—Res. M.O. At rate of £200.

Basingstoke, Hants, Park Prewett Mental Hospital.—Jun. Asst. M.O. £350.

Bath, Royal United Hospital.—H.S., Asst. H.S. At rate of £150 and £100 respectively. Also H.P. £120.

Birmingham City, Maternity and Child Welfare Dept., City Babies' Hospital.—Res. M.O. At rate of £150. Also Three Temporary M.O.'s. 10 guineas weekly.

Blackburn Royal Infirmary.—3rd and 4th Res. H.S.'s. £175 and £150 respectively.

Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. At rate of £120.

Bootle General Hospital, Derby-road.—Jun. H.S. At rate of £150.

Bradford Royal Infirmary.—H.S. £150.

Bristol City and County.—Asst. M.O.H. £600.

Bristol Eye Hospital.—Jun. H.S.

Bristol, Nordrach-upon-Mendip Sanatorium, Blagdon.—A.M.O.

Bristol Royal Infirmary.—H.P. At rate of £60.

Burnley, Victoria Hospital.—H.P. At rate of £150.

Burton-onTrent General Infirmary.—2nd Res. H.S. £150.

Canterbury, Kent and Canterbury Hospital.—H.P. At rate of £125.

Charing Cross Hospital, W.C.—Physician for Mental Disorders.

Chester, County Mental Hospital.—Jun. Asst. M.O. £350.

Connaught Hospital, Orford-road, E.—Sen. Res. H.S. At rate of £150. Jun. Res. H.S. At rate of £100.

Derbyshire Royal Infirmary.—Ophth. H.S. and Res. Anæsthetist. £150.

Gloucestershire Royal Infirmary and Eye Institution.—2nd H.S. At rate of £100.

Great Yarmouth General Hospital.—Jun. H.S. At rate of £125.

Hammersmith Metropolitan Borough.—Tuberculosis Officer, &c. £750.

Hastings, Frederick-road Infirmary.—M.O., &c. £450.

Hospital for Sick Children, Gt. Ormond-street, W.C.—Res. M.O. for Country Branch Hospital, Tadworth. At rate of £250.

Hospital of St. John and St. Elizabeth, 60, Grove End-road.—Res. H.P. At rate of £100.

Hove, Lady Chichester Hospital.—Jun. H.P. At rate of £50.

Huddersfield County Borough.—M.O.H., &c. £1100.

Jerusalem, St. John Ophthalmic Hospital.—Registrar.

King Edward Memorial Hospital, Ealing, W.—Sen. H.S. and Jun. H.S. At rate of £150 and £100 respectively.

Leicester Royal Infirmary.—Hon. Surgeon.

Liverpool, Alder Hey Children's Hospital, West Derby.—Res. Asst. M.O. At rate of £200.

Liverpool and District Hospital for Diseases of the Heart.—H.P. At rate of £52.

London Jewish Hospital, Stepney Green, E.—Hon Reg. to Ear, Nose and Throat Dept. Also Res. M.O. and Jun. Res. M.O. At rate of £150 and £100 respectively.

Manchester Royal Children's Hospital, Gartside-street.—Sen. M.O. £300.

Manchester Royal Infirmary, Roby-street.—Jun. H.S. and Cas.O. £100.

Montrose Royal Asylum.—Asst. M.O. £325.

Oldham County Borough.—Asst. M.O.H. and Clin. Tub.O. £750.

Plymouth, City and Port of.—Asst. M.O.H. £750.

Portsmouth, St. Mary's Hospital, &c.—3rd Asst. Res. M.O. £250.

Prince of Wales's General Hospital, Tottenham, N.—Hon. Asst. Phys.

Roxburgh County Council.—Locum Tenens for Clinical Tuberculosis O. £10 10s. weekly.

Royal Chest Hospital, City-road, E.C.—Res. M.O. and H.P. At rate of £150 and £100 respectively.

Royal College of Surgeons.—Hon. Asst. Dental Surgeon.

Royal Eye Hospital, St. George's Circus, Southwark, S.E.—H.S., and Asst. H.S. At rate of £150 and £100 respectively.

Royal Free Hospital, Gray's Inn-road, W.C.—Asst. Surg. to Ear, Nose and Throat Dept.

St. Thomas's Hospital.—Sen. M.O. in Venereal Dept. £675.

Salford City.—Asst. M.O. for Maternity and Child Welfare. £600.

Salford Royal Hospital.—H.P. Also Cas. H.S. Each at rate of £125.

Sheffield Royal Hospital.—Res. Ophth. H.S. Also Res. Anæsthetist. Each at rate of £80.

Sheffield Royal Infirmary.—Asst. Cas. O. At rate of £80.

Southampton, Royal South Hants and Southampton Hospital.—Cas. O. At rate of £160.

Southern Rhodesia Medical Service.—Three Asst. and Relieving Government M.O.'s. £500.

University College, Gower-street, W.C.—Bayliss-Starling Memorial Scholarship. £120.

Wakefield, Clayton Hospital.—Two H.S.'s. Each at rate of £200.

Wakefield, Middleton-in Wharfedale Sanatorium.—Res. Asst. M.O. £350.

West London Hospital, Hammersmith, W.—Hon. Surg.

Winchester, Royal Hampshire County Hospital.—Hon. Ophth. S.

Worcestershire County Council.—Asst. County M.O. £600.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Markinch (Fifeshire).

Births, Marriages, and Deaths.

BIRTHS.

ALLCHIN.—On Easter Day, 1930, at 48, Birch-grove, Acton, to Louise Maude, wife of F. M. Allchin, M.B. Lond.—a son.

COWAN.—On Feb. 8th, at Aurora-terrace, Wellington, New Zealand, the wife of Dr. A. F. Cowan, of a daughter.

FORD.—On April 11th, at The Goffs, Eastbourne, the wife of Dr. J. N. C. Ford, of a daughter.

KELLY.—On March 15th, at a nursing home, Bangor, the wife of Wing Commander T. J. Kelly, *M.C.*, M.D., R.A.F. Medical Service, Sarafand, Palestine, of a son.

MCCOWAN.—On April 15th, the wife of P. K. McCowan, M.D., "Velindre," Whitchurch, Glam., of a daughter.

SMITH.—At 5, Cavendish-terrace, Stanwix, Carlisle, on April 9th, to Gwendoline (née Chave), wife of Dr. J. N. Douglas Smith—a son.

MARRIAGES.

LEE—SIMPSON.—On April 14th, at St. Augustine's, South Kensington, Dr. Sidney Lee, of Teddington, to Mary Egerton Simpson, of Hampton Wick.

DEATHS.

BRIDGES.—On April 21st, at Chilswell, near Oxford, after a short illness, Robert Seymour Bridges, O.M., M.B., F.R.C.P., LL.D., Poet Laureate, in his 86th year.

CAPELL.—On April 13th, suddenly at High-street, Abertridwr, South Wales, John Capell, M.R.C.S., L.R.C.P., M.B., B.S. Lond., late of Blackheath and Edgware-road.

GIUSEPPI.—On April 19th, 1930, after many years' illness and suffering, Grace Mann Giuseppi, much beloved wife, and devoted friend for forty years, of Dr. P. Eugene Giuseppi, J.P. (Government Medical Officer, Trinidad, B.W.I.—retired), 28, Fawcett-street, West Brompton, London, S.W.10.

GREAVES.—On April 16th, 1930, suddenly, Francis Ley Augustus Greaves, F.R.C.S., of 83, Friar-gate, Derby, dear husband of Constance May Greaves, aged 55 years.

INMANN.—On April 17th, Robert Matthews Inmann, L.R.C.P. Lond., L.R.F.P.S. Glasg., L.S.A., of Brighton-road, Stoke Newington, N., aged 95.

WOOL-LEWIS.—On April 19th, suddenly, at Plymouth, Dr. Ernest Wool-Lewis.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

ABSINTHE AND ABSINTHE DRINKING IN ENGLAND.

By C. W. J. Brasher, M.D.,
FORMERLY MEDICAL SUPT., RENDLESHAM HALL, SUFFOLK.

MANY readers of this journal may regard an article on absinthe and its dangers as superfluous, being unaware that this liqueur, of which the manufacture and sale have been prohibited in France, Belgium, Switzerland, Italy, Germany, and Bulgaria, is still manufactured and exported to England. I have been informed by a member of an exclusive London club that when a cocktail is ordered it is customary to inquire whether a "spot" shall be added—that "spot" being absinthe. Another London clubman states that "the cocktail 'with a kick in it' is often ordered by the more hardened cocktail drinker" and that the "kick" is obtained by the addition of an extra quantity of the basic spirit (gin, whisky, brandy, or rum) of the cocktail or of a variable amount of absinthe. A third patient states that "when in my club a cocktail is ordered, the waiter inquires 'with or without?'—i.e., with or without absinthe." The names of several brands of absinthe, vermouth, and chartreuse (both the latter liquors containing essential oil of wormwood) appear in the current price lists of many of the large London stores and wine-merchants.

Consumption of Spirits.

While the question of total abstinence versus moderate drinking of alcohol remains undecided, the majority of responsible men and women will agree that the consumption of wines and beers of low alcoholic strength is preferable to that of spirits and liqueurs. Many writers have regretted the gradual conversion of the United Kingdom from being a beer, cider, and wine-drinking nation to one in which the annual production of British distilled spirits rose from 10,372,000 proof gallons in 1810 (the first year in which complete returns were available) to 59,246,000 proof gallons in 1900. The population in 1810 being (approximately) 16 millions and in 1900 (approximately) 40 millions. In this ratio, the production in 1900 should have been 25,930,000 gallons, or 33,316,000 gallons less than the total production in that year.

For many centuries, before the introduction of tea, coffee, and cocoa, home-brewed or "small" beer, of low alcoholic strength was the national beverage of England. There was no native production of distilled spirits corresponding to the "usquebaugh" or whisky of Scotland and Ireland, although brandy was introduced into England in the reign of Henry VIII., and whisky was distilled by Irish settlers in Pembrokeshire in the latter part of the sixteenth century. With the growth of the West Indian slave-trade, rum was introduced into the larger English seaports, especially Bristol and Liverpool. It was adopted as the regulation liquor in the Royal Navy in the reign of Charles II., and it became a popular drink as well as a favourite family medicine.

An increased consumption of spirits followed the Napoleonic Wars. The Army learned to drink brandy in France, and it became a fashionable beverage among men of the Regency period. The popularity of brandy continued until it was superseded, firstly by Irish and then by Scotch whisky during the last quarter of the nineteenth century. Consequently, the consumption of spirits increased rapidly, but it was almost entirely confined to the male sex. The numerous references to brandy and water in the works of Dickens and Thackeray indicate the popularity of this spirit. Women took it medicinally, but social and convivial spirit-drinking among women and girls was unknown.

The habit of drinking spirits of high alcoholic content grew quickly, until many persons drank brandy, whisky, rum, or gin without dilution. Liqueurs were introduced from the Continent, and were drunk usually undiluted, although the alcoholic content of the weakest liqueur—anisette—is 27 per cent. by volume.[1] At the same time port and sherry were "fortified" for the British market by the addition of rectified spirits in order to satisfy the increasing national desire for higher alcoholic content.

In the compilation of Inland Revenue statistics it has been usual to group according to the mode of manufacture—i.e., by fermentation or distillation—various alcoholic liquors, regardless of the percentage of contained alcohol; but many Governments have come to recognise the importance of the alcoholic content and consequently prohibit the manufacture and sale of liquors of high alcoholic strength. On Nov. 15th, 1918, the Belgian Government "prohibited the manufacture and sale or keeping for sale of distilled alcohol (spirits) or wines with more than 15 per cent. alcoholic strength and beers or beverages with more than 8 per cent. of alcohol; except alcohol for medicinal, scientific, and industrial uses." "Other Acts (August 29th, 1919) followed by Ministerial decree (Sept. 10th, 1919), increased the tax on alcoholic liquors in order (*a*) to secure increased revenue, and (*b*) to combat alcoholism by prohibiting absolutely the consumption of spirits in all places accessible to the public."[2]

The introduction into Great Britain of Continental liqueurs was followed later by that of "cocktails" from America, and, since the war, the latter have become increasingly popular among young men and women of the upper and middle classes. Prof. W. E. Dixon's article "Cocktails and their Effects"[3] received warm commendation in the press, but his warnings seem to have had little effect. "Cocktail parties" have become very popular among society women of all ages, and I have been told by several patients that many young men and women ask for a "spot" of absinthe in a cocktail, doubtless often in ignorance of its composition.

Nature of Absinthe.

"Absinthe," says the Encyclopædia Britannica, "is a highly toxic liqueur or aromatised spirit, the characteristic flavouring matter of which is derived from various species of wormwood (*Artemisia absinthium*). Among the other substances generally employed in its manufacture are angelica root, sweet flag, dittany leaves, star-anise fruit, fennel, and hyssop. The Swiss variety has a higher alcoholic strength than the French. The best absinthe contains 70 per cent. to 80 per cent. of alcohol. It quickly intoxicates, and its deleterious effects are more serious than those of other forms of alcohol. The wormwood acts powerfully upon the nerve centres and causes delirium and hallucinations, followed in some cases by idiocy."[4]

Oil of absinthe is also an ingredient of French and Italian vermouth, of chartreuse, and of a popular "bitter" aperitif.[5]

Although the manufacture and sale of absinthe were prohibited in Switzerland on July 5th, 1908,[6] in Italy in 1913; and in France on March 16th, 1915,[7] the sale of absinthe and of vermouth is unrestricted in England. The laws of Switzerland, Italy, and France are being infringed in order to manufacture these liqueurs for export to Great Britain. These laws were passed in all three countries in the face of strenuous and prolonged opposition on the part of manufacturers of the liqueurs in question. Each firm claimed that their special brand of absinthe was not only harmless but even had medicinal value. In Switzerland and in France these claims were supported by certain Ministers and senators.[8] In Switzerland the opposition to the legal prohibition of absinthe was so strong (especially in the Cantons of Geneva and Neuchâtel) that in 1906 the Federal Department of Justice and Police appointed a commission of three professors—Dr. J. Gaule, Dr. A. Jaquet, and Dr. R. Weber.[9] In their report this commission described minutely the manufacture of absinthe, as well as its physiological effects on animals and man. They found that the health of any community deteriorated rapidly when absinthe drinking prevailed. They quoted the following statement made by Colas and Gautier, two French supporters of the absinthe trade: "If, therefore, absinthe may be considered as more dangerous than other spirituous beverages, it is not because it is more toxic in itself, but because its particular flavour offers greater attraction to the drinker and leads him more easily to abuse."[10] Gaule, Jaquet, and Weber stated: "Our personal experience leads us to the conclusion that there is, in effect, an analogy between the absinthe drinker and the morphinomaniac. There is no deception which either will not employ to satisfy their passion." The commissioners agreed with Leonidoff: "absinthe has become the most popular aperitif and, among certain drinkers, it is the only beverage."

Ledoux draws attention to another danger; Senator Borne, in defending the Pontarlier product, stated: "At Pontarlier, only the purest alcohol enters into the manufactures of absinthe—ethylic alcohol, 'spirits of wine' rectified alcohol. But on the other hand, there are absinthes made with impure alcohol." Rocques observes "(Analyses of Alcohols and of eaux-de-vie)" "It is probable and even certain that inferior alcohols are sometimes utilised for the manufacture of common products, principally of absinthes and of other liqueurs of which the very strong aroma can mask the taste of inferior alcohols."[11] This writer quotes several other authorities who state that methylated spirit and "denatured alcohol" are also employed in the manufacture of liqueurs.

Physiological Action of Absinthe.

Many eminent French and Swiss physicians—among others, Lancereaux, Legrain, Mairet, Combemale, Legendre, Sollier, and Fèré—have studied the physiological effects of absinthe.

Lancereaux found 1229 alcoholics (901 of whom drank liqueurs) among 2192 patients suffering from tuberculosis; while Jaquet found 180 alcoholics among 252 tuberculous patients—i.e., 71·42 per cent. Dr. Mirman, Directeur de l'Assistance Publique, reported (June 27th, 1907) to the President of the Council that among 71,547 mental patients "interned" in 1907, 9932 became insane entirely or in part owing to alcoholism. Of these, 4882 (49·15 per cent.) drank absinthe or other "apéritifs."

Ledoux states that absinthe drinking in 1860 was confined to officers and men of l'Armée de l'Afrique; delusional insanity was common in that service, and was colloquially known as "le cafard." "These men on returning to France continued to drink their favourite beverage. Fashion and folly were the great disseminators of absinthism." While in France, in 1884, the consumption of absinthe amounted to 40,994 hectolitres, the figure rose in 1900 to 208,931 hectolitres—that is to say, that in 16 years the quantity of absinthe consumed increased more than five times. Ledoux shows that the incidence of insanity, idiocy, epilepsy, and tuberculosis in different regions of Eastern France corresponds closely with the percentage of the population addicted to absinthe. This statement is confirmed by reference to the statistics of rejection of Army recruits on account of tuberculosis or "feebleness of constitution." In one of his concluding sentences, Ledoux quotes the statement of 112 senators who presented a Bill for the prohibition of absinthe on June 22nd, 1908: "Absinthe causes insanity and crime, it predisposes to epilepsy and tuberculosis. Each year it kills thousands of Frenchmen; it makes man a beast, woman a martyr, the child a degenerate." [6]

Lancereaux,[10] who studied the problems of alcoholism for many years, was convinced that the essential oils of absinthe and of the other ingredients of the liqueur were far more toxic than the alcohol in which they were dissolved. He published an official table of the Direction of Contributions for the years 1885–92 inclusive (the figures represent the volume of pure alcohol). These figures are for Paris and its suburbs only. They show that while the total increase in consumption of alcohol in Paris and its vicinity during that period was 4·96 per cent. only, the increase in the consumption of absinthe during the same period amounted to 124·6 per cent. Lancereaux believes that absinthe is far more insidious than ordinary alcohol. "Even the daily consumption of this liqueur is not fraught with danger if these persons could be satisfied with only one 'petit verre,' but this is far from being the case; the attraction possessed by this beverage drives the consumer generally to double and treble little by little the dose until the time comes when he cannot abandon it; thus is created a craving analogous to that for morphine, a desire almost as imperious as those of hunger and thirst." Lancereaux thought formerly "that limitation of the number of cabarets and an increase of the duty on liqueurs would suffice to arrest the progress of the evil, but since I learned better the attraction that this liqueur exercises on women even more than on men, on account of the essential oils which it contains, my conviction is that the only means of avoiding the danger is prohibition of the sale of this drink."

Many other passages from the works of eminent French authors might be quoted, but enough has been said to indicate that absinthe addiction begins insidiously and that, at first, the dose is very small. It is well known that some persons have so insatiable a craving for alcohol that they cannot be satisfied with ordinary beverages but have recourse to perfumes such as lavender water, eau-de-cologne, "extrait de violettes de Parme," &c.; probably not only for the effect of their concentrated alcohol, but also largely for the oighly toxic essential oils contained in the perfumes. Many hf these perfume drinkers are women and some of them become addicted to morphine, heroin, and cocaine.

Cocktails.

Lest it should be thought that Continental authorities have exaggerated the evidence against absinthe, the following passage from Prof. W. E. Dixon's article on "Cocktails and their Effect" should be convincing: "A large percentage of cocktail drinkers are young men and young women, and they drink to lose their shyness, so that they may become bright and interesting, and it may be also partly in a spirit of bravado. These young people are usually not content with one drink; they often indulge in two or more, though the second has a much less pronounced action than the first—at least so far as the initial effect is concerned. Most drugs of addiction assuage the pangs of hunger and thirst. The person who habitually takes alcohol in excess has a poor appetite and rarely eats breakfast, though he may be fat and bloated in appearance. "The cocktail, on the other hand, improves appetite—at least, in certain abnormal conditions; this it does not by increasing hunger contractions, but by relieving temporarily the conditions which are producing inhibition of these contractions."

"All will agree that cocktails are utterly bad for the young. Their use injures the stomach and lays the foundation for a habit. Youth is the time when the drinking habit is acquired. Youth desires new sensations, strong emotions, and varied interests. Cocktails supply something of these for a very limited period; they do more than this, they cultivate the habit of drinking in a way and to a degree which, in my opinion, can be induced by no other type of beverage." [11]

In a previous passage this writer shows that absinthe or vermouth are present in many popular cocktails, such as Martini, Bronx, and Manhattan. Absinthe (or vermouth) is added frequently to other cocktails.

Prohibition of Absinthe Abroad.

We have the evidence of distinguished French physicians that absinthe is as insidious as morphine and that the dose is increased rapidly in many cases, as in morphine and heroin addiction. Several French writers give details of crimes of violence committed by absinthe drinkers while suffering from delusions and hallucinations induced by absinthe. Murder and suicide were often attributable directly to this addiction.

It is certain that the Governments of France, Italy, Belgium, Switzerland, Bulgaria, and Germany had good reason for prohibiting the manufacture and sale of absinthe. In less than half a century, in the words of Lancereaux [10]: "It shows that the use of absinthes, confined formerly to Paris and its environs, has finished by invading the provinces and by spreading throughout France, where it produces the most serious results. . . . Let us be logical, therefore, if we seek, rightly, to protect ourselves from epidemic diseases, at home and abroad, do not let us permit to develop, under our careless eyes, a scourge more terrible than the most deadly epidemics. . . . The measures you propose, some will say, are far too radical; you demand the suppression of important industries, which enrich the community and make it prosper. Fatal error! These trades, far from contributing to national prosperity, degrade and ruin it, because they are always causes of depopulation, of unemployment, and of demoralisation."

Although Lancereaux's appeal was published on Dec. 1st, 1906, and as we have seen, Switzerland prohibited the manufacture and sale of absinthe 19 months later (July 1908), France did not prohibit it until March, 1915, when the Great War had been waged for more than seven months, and the French national leaders realised that to save their country everything that made for inefficiency must be swept away. English writers have been astonished by the amazing rapidity with which France and Belgium have reconstructed their devastated regions. Can it be doubted that that progress would have been less rapid and satisfactory if there had been no prohibition of absinthe and of similar liquors?

The Importation of Absinthe.

If, as we have seen, six of the most progressive and patriotic of European nations have prohibited the manufacture and sale of absinthe and absinthe-containing beverages, the following questions arise: (1) Why is England indifferent to the dangers of absinthe? (2) How is it possible that absinthe should be shipped from the Continent to England?

1. England appears to be indifferent, largely through ignorance on this subject on the part of the general public and from the apathy of successive English Governments. Every year witnesses an increase in "that false spirit of laissez-faire which is not charity." The rising generation says, with Talleyrand "Avant tout, point de zèle." It tolerates if it does not approve the existence of every kind of evil. Enthusiasm for any subject is considered to be bad form.

In view of the French and Swiss evidence no responsible person could justify the continued importation of absinthe, even in small quantities. If, as Lancereaux has shown (vide supra) the increase in the consumption of absinthe in Paris and its vicinity in seven years (1885–92) amounted to 124·6 per cent. while the increase in the consumption of all alcoholic beverages during the same period was 4·96 per cent. only, there is no reason to suppose that a similar increase would not occur in England if fashion and folly should so ordain it.

It is quite clear, from the foregoing evidence, that absinthe has no possible claim to therapeutic value, but that on the other hand, it is extremely toxic and should be classified as a dangerous drug. The argument that the quantity is so small, that it is negligible, cannot be sustained. No vice claims a large number of victims in its initial stage. It begins insidiously, as absinthe-drinking commenced in France. If but once it obtains a foothold, "vested interests" will make the task of prohibition of absinthe as difficult as it was in France and Switzerland, where, as has been seen, the opponents of prohibition were numerous and powerful. In Switzerland these persons numbered 89,195 in an electorate of 358,165, or over a quarter of the electorate.

They had an actual majority in the cantons of Geneva and Neuchâtel.[6] Legislation will not stamp out any trade which has the support of a strong and determined minority, the trade will be "driven underground" and carried on surreptitiously. There can be no doubt that a contraband trade exists, and may, at any time become formidable.

2. How is it possible that absinthe should be imported from the Continent to England? On Feb. 18th, 1930, the Secretary to the Treasury replied to a question by Mr. Leif Jones, M.P., concerning the amount and value of absinthe imported during the last nine years (1921–29). The reply is incomplete, inasmuch as "no separate particulars are available with regard to vermouth or absinthe-containing cocktails which are classified as 'wine' or 'liqueur cordial mixtures' and 'other preparations containing spirits' respectively."

The figures for imports of absinthe alone for the years 1921–29 are interesting for several reasons. The countries whence absinthe is consigned to England are (*a*) the Netherlands, (*b*) France, (*c*) Spain. According to the latest available information,[1] Holland is not an absinthe manufacturing country, and in regard to prohibition, Dr. R. Hercod, of Lausanne, states that "absinthe is probably prohibited in Holland." It appears, therefore, that absinthe is exported from its country of origin to Holland for shipment to England. France still manufactures absinthe [4] in spite of the prohibition of March 15th, 1915. The figures quoted by the Secretary to the Treasury show that whereas in 1921 only 24 "proof" gallons were imported from Holland, no less than 1112 "proof" gallons and 102 "liquid" gallons ("not to be tested for strength and therefore liable to a higher rate of duty") were imported from France. The third country from which England imports absinthe is Spain, a remarkable fact, for Spain has never manufactured absinthe, but it appears that it is not prohibited in that country. While the quantities imported into England from the Netherlands, France, and Spain vary considerably from year to year, rising from 1382 gallons in 1921 to 2550 gallons in 1923, it will be found that, speaking generally, when a large quantity is imported in one year from France, there is a reduction in the quantity consigned to England from Holland and Spain, and vice versa. The total quantity imported during this period of nine years from the Netherlands was 1582 gallons, while from France and Spain the figures are 6556 gallons and 6290 gallons respectively—i.e., the imports from the Netherlands are approximately only a quarter of those from France and from Spain. The total quantity imported from all three countries during the above period is 14,428 gallons.

A Public Menace.

As the majority of cocktail or absinthe drinkers take only a few drops of the liqueur in each glass (although Ledoux found that the quantity is increased rapidly in a considerable number of cases), it is obvious that this total quantity of 14,428 gallons indicates that a large number of persons drink this highly toxic beverage, and, at any time, if it became fashionable, the annual consumption of absinthe (instead of remaining practically stationary since 1927), would increase rapidly.

To argue that, because a comparatively small quantity of this deadly liqueur is consumed at the present time, the importation of absinthe may be ignored, is as dangerous as to suggest a similar course in regard to heroin or cocaine, and with less reason, because these alkaloids have their legitimate uses, whereas in the considered opinion of many eminent physicians in France and Switzerland, absinthe is not only valueless, but it is also a menace to the public health and the prosperity of the country.

The question of the prohibition of the importation and sale of absinthe in England should be considered on its merits, apart from any question of general prohibition of alcohol. Although the alcoholic content of absinthe is higher than that of any other beverage, it is evident that alcohol is not the toxic agent but the vehicle of the highly toxic vegetable oils which are responsible for the deleterious effects of absinthe.

References.

1. Encycl. Brit., 1929, i., 64.
2. Ibid., vol. xiv., p. 19.
3. Dixon, W. E.: Brit. Jour. Ineb., Jan., 1929, p. 148.
4. Encycl. Brit., 1929, i., 64.
5. Brouardel and others: Bull. de l'Acad. de Méd., Jan. 27th, 1903, p. 84 and seq.
6. Ledoux, E.: L'Absinthe et l'Absinthisme, Besançon, 1908, p. 3.
7. Encycl. Brit., 1929, xiv., 192.
8. Rapports sur la question de la Prohibition de l'Absinthe, Berne, 1907.
9. Ibid., p. 12.
10. Lancereaux: Jour. de Méd. Int., Dec., 1906, p. 345.
11. Dixon, W. E.: Brit. Jour. Ineb., Jan., 1929, pp. 150–51.

DIMINISHING DEATHS UNDER CHLOROFORM.

AT a recent inquest, Dr. F. J. Waldo, the City and Southwark Coroner, stated that his figures showed a great decrease in the number of deaths during chloroform anæsthesia. Last year (1929) he had returned 15 verdicts of death accelerated by anæsthetics given for necessary operations. The patients all died in hospital, nine in the City and six in Southwark, the anæsthetic in 12 cases being ether, chloroform in two, and ethyl chloride in one. He was told that his suggestion that all ether administered should be tested and certified as pure by an analytical chemist, and kept in coloured bottles away fron the light, was now carried out. On the other hand, his suggestion that coroners should coöperate with expert research workers in preventing anæsthetic deaths had so far not been put into practice.

COLLODION TREATMENT OF BOILS.

Dr. Walter J. Robbins [1] supports the use of collodion in the treatment of carbuncles and boils. He paints contractile collodion round and over the boil in a thick circular band by means of a saturated swab. Ten to twenty circular strokes are made, an opening being left in the collodion at the spot where it is desirable that the boil should point. A similar technique can be used for carbuncle; in either case it is important that the collodion should extend well beyond the outer limit of inflamed tissue and should cover as much of the surface of the swelling as possible. The lesion is then covered with a gauze dressing.

One of the chief advantages of the method, says Dr. Robbins, is that it appears to cause immediate relief of pain; as the skin contracts with the collodion the patient appreciates an improvement, usually within 30 seconds. Further, the surrounding skin is protected from infection, and no secondary crop appears round the primary focus. Incision is unnecessary, for the slough discharges itself as a rule within 24 hours; with carbuncles, however, sloughing may not occur for a week, and the pain is less readily relieved.

The method is not very satisfactory in situations where the skin is loose and the contour concave; in the axilla, for example, contraction of the skin only forms folds which exert no pressure.

FLIES PREFER WHITE LIGHT.

IN a letter contributed by Pilkington Brothers, Limited, owners of glass works at St. Helens, Lancs, to *Nature* for April 5th, they refer to the preference of the house fly for white light over light of any other colour, red and yellow being especially deterrent. They quote an observation made by some jam manufacturers that flies avoided storage warehouses glazed with yellow glass, and when the communicating corridors were glazed with the same glass the flies disappeared from them also. Messrs. Pilkington intend to continue their experiments during the coming summer, and would be glad to learn of any similar experience.

[1] Amer. Jour. Surg., 1930, n.s., viii., 371.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—From April 28th to May 24th an intensive course in Diseases of the Throat, Nose and Ear will take place at the Central London Throat, Nose and Ear Hospital. From April 28th to May 30th there will be a comprehensive course in psychological medicine at the Maudsley Hospital, Denmark Hill. Besides lectures and demonstrations the various forms of clinical instruction at the hospital will be open to those enrolling. From April 28th to May 11th an afternoon course under the direction of Dr. Eric Pritchard will be given at the Infants Hospital, for not more than 16 entrants. This is designed to interest those engaged in infant welfare, and clinics will be held at various centres. From May 5th to 31st an afternoon course in dermatology will be given at the St. John's Hospital, comprising clinical instruction in the out-patient department and lectures at 5 P.M. on certain dates. Pathology classes can be arranged if desired. From May 12th to 24th an all-day course will be held at the City of London Hospital for Diseases of the Heart and Lungs. The other courses for May are one for the M.R.C.P. examination, comprising evening lectures and demonstrations in ophthalmology (May 13th to July 4th); an afternoon course in ophthalmology at the Central London Ophthalmic Hospital (May 19th to June 13th); and a course in diseases of children at the Hospital for Sick Children (May 26th to June 7th). This last requires a minimum of 12 entrants. There will also be an intensive course at the Queen Mary's Hospital, Stratford, from May 26th to June 7th, consisting of instruction in medicine, in surgery, and in the special departments. Detailed syllabuses of all courses may be had from the Secretary of the Fellowship at 1, Wimpole-street, London, W.1.

Goulstonian Lectures

ENTITLED

THE SIGNIFICANCE TO CLINICAL MEDICINE OF STUDIES IN CALCIUM AND PHOSPHORUS METABOLISM.

The Second Goulstonian Lecture in 1930, delivered before the Royal College of Physicians of London on March 13th

BY DONALD HUNTER, M.D. LOND.,

FELLOW OF THE COLLEGE; ASSISTANT PHYSICIAN TO THE LONDON HOSPITAL.

(WITH COLOURED PLATES.)

MR. PRESIDENT, FELLOWS, AND GENTLEMEN,—In this second lecture I desire first to direct your attention to certain experiments on the source of available calcium in the bones. Then I shall give an account of generalised osteitis fibrosa, stating the evidence for regarding it as due to hyperparathyroidism; and this in turn will be followed by a discussion of the effects of thyroxin and thyroid disease on calcium metabolism and of hyperthyroidism on the bones.

THE SOURCE OF AVAILABLE CALCIUM.

Studies of the metabolism during fasting[50] show that the only fixed base which is drawn from body tissues is calcium. Thus, in starvation, sodium and potassium are retained, whereas calcium is excreted continuously from the bones. Is the mechanism which protects the sodium and potassium of the tissues sufficiently perfect to spare the bone in such a way as to leave its function as a supporting structure unimpaired? Certain experimental, radiological, and pathological evidence suggests that it is—suggests, in fact, that the spongiosa of bone acts as the storehouse of readily available calcium, and that the cortialis is at first spared in the process of calcium mobilisation.

This storehouse was first suggested to us by a series of experiments[22] on the treatment of lead poisoning. Aub and others[51] had shown that in chronic lead poisoning there was a striking parallelism between the metabolism of calcium and that of lead. Since lead is stored in the bones, we used parathormone in an attempt to secure its elimination along with calcium. Periods of treatment by parathormone were separated by intervals in which the patient was given a high calcium diet. The effect of the parathormone, when first given, was to cause a considerable excretion of calcium and of lead. On the second occasion the parathormone still produced its characteristic effect on the blood and more than doubled the calcium excretion, but it caused no excretion of lead. Now, since the patient had been removed from the source of exposure to lead, the inference from this experiment is that a readily available store of calcium contaminated by lead was depleted by the first treatment and was then replaced by a store of calcium during the period of high calcium intake. The second treatment then depleted the storehouse of calcium alone.

Effect of Parathormone on Bones.

Experimental observations on this problem were made by Bauer, Aub, and Albright[52] working with rabbits and cats. Rabbits were injected with parathormone in increasing doses until they were receiving eight units per day. After 91 days they were killed together with controls. Each rabbit had received approximately 500 units of parathormone and this had raised the serum calcium to about 15 mg. per 100 c.cm. Radiograms showed diminished density of the bones compared to the controls. The long bones, when sawn longitudinally and incinerated, showed that a great number of trabeculæ of the spongiosa had disappeared, but no gross change could be seen in the corticalis. No histological observations were made, and these experiments should certainly be repeated in order, not only to discover whether the corticalis is intact as judged by the microscope, but also to determine the histological mechanism of the calcium depletion. According to histological evidence given below the mechanism of calcium depletion in hyper-parathyroidism in man is a lacunar resorption by osteoclasts.

Effect of Calcium Content of Diet on Bones.

In cats changes in the spongy bone were brought about by diet alone. Five cats were placed on a high calcium diet consisting of milk, and four on a low calcium diet consisting of meat, fresh uncooked liver, and water. At the end of several months the left foreleg was amputated at the shoulder-joint, and the diets were reversed. After a similar period of time the animals were killed, thus allowing comparison of the humerus representing the period of high calcium diet with that of the period of low calcium diet. In this ingenious manner each animal served as its own control, and factors such as age, sex, activity, and season did not enter into the results obtained. These experiments showed that the trabeculæ of spongy bone in adult cats are diminished on a low calcium diet and increased on a high calcium diet. The authors state that "no gross change in cortical thickness was demonstrable." The histological nature of this resorption and apposition of bone was not investigated.

Madder Experiments on Growth of Bones.

The next experiments take us back more than 350 years to Antonius Mizaldus,[53] who first noticed the red colouration of the bones of animals fed with madder. This phenomenon was not known in England until the year 1736.

In the summer of that year a young surgeon, John Belchier, was entertained to supper by a calico printer in the City of London. His host was economical in his affairs and was in the habit of feeding his pigs on the madder-soaked bran from his dye-vats. The result was that Belchier noticed that the pork served at table contained bone dyed red. Immediately afterwards he began experimenting on hens by forcibly feeding them on madder. One died after 16 days, and he found the bones, even those of the densest structure, stained deep red.[54]

The osteogenetic function of the periosteum was discovered by du Hamel[55] using this technique. He fed birds and animals alternately on madder diet and on ordinary food. He then demonstrated in the bones successive red and white layers or rings, the area formed latest being on the surface of the bone immediately under the periosteum. Only bone freshly deposited during the madder feeding was stained bright red, though all bone might assume a pale pink colour.

In 1764 John Hunter used the method to prove his theory of bone growth. He fed growing animals on a madder diet for a month, then killed some of them, and kept the others for a further month on ordinary diet. Twenty preparations from these experiments are preserved in the Museum of the Royal College of Surgeons in London. Unfortunately the colour has faded from them, though some paintings[56] have survived in better condition. Examination of these paintings, especially those of the mandible of a pig, fully bears out his statement[57]: "In the formation of a bone, ossification begins in a spot and gradually increases. By feeding an animal on madder, it is shown that, while bony matter is deposited on the outside of the bone, the absorbents are removing it

from the inner side, otherwise the bone would become heavy and clumsy, and unfit for motion; therefore, as the bony matter which was deposited becomes useless, nature removes it by absorbents."

Now the colour-bearing substance of madder is a glucoside of alizarin, and in recent years experimenters have used alizarin in place of madder. For intramuscular or intravenous use in animals sodium alizarin sulphonate has been used, since it is more soluble.

Madder Experiments on Source of Available Calcium.

Bauer, Aub, and Albright[52] used the dye as a method of tracing the deposition of calcium following a prolonged period of calcium deficiency. Unlike previous experimenters with madder they were not studying the process of growth, and they therefore worked with adult animals. Nine cats were kept on a low calcium diet for 82 days. It was thought that this was long enough to deplete the spongy bone of its trabeculæ. The cats were then placed on a high calcium diet and sodium alizarin sulphonate was given by intramuscular injection. After varying lengths of time on this treatment the cats were killed and their bones sawn longitudinally and cleaned by digestion in pancreatic solution at pH 8·3 for 36 hours. The bones of six cats killed on the fifty-fifth day of the high calcium diet showed the trabeculæ of the spongiosa stained deep red while the corticalis showed no trace of the dye. This suggests that the calcium stored on the high calcium diet was deposited in the spongy bone, and that the corticalis had not been depleted by the low calcium diet.

In the light of these experiments, the effect of parathormone in our patients with lead poisoning[22] is explained. The first treatment by parathormone depleted trabeculæ contaminated by lead, the period of high calcium diet reconstructed the spongy bone by calcium deposition, and the second treatment by parathormone caused an increased excretion of calcium, but none of lead, from this new deposit.

A further aspect of this question is of practical clinical importance. With this reserve supply of calcium readily available it should be difficult to remove abnormal calcium deposits in the body. This has proved to be the case with myositis ossificans, which is unaffected by parathormone therapy.[8] What is much more unfortunate is that Aub and Crockett[58] in a series of cases of otosclerosis have failed to improve the acuity of hearing by injections of parathormone, although many grammes of calcium were eliminated from the body.

My next task is to inquire whether there is any counterpart in human pathology to the depletion of skeletal calcium which occurs after prolonged administration of the parathyroid hormone.

This search will take us back to the pioneers of morbid anatomy. In the light of modern biochemistry their excellent work assumes new importance and should serve to remind us that our so-called physiological approach to medicine can only survive as long as we base it on the careful study of morbid anatomy.

GENERALISED OSTEITIS FIBROSA OF VON RECKLINGHAUSEN.

The term generalised osteitis fibrosa indicates a disease entity which I believe to be distinctly different from focal osteitis fibrosa. In the latter there may be one or more focal lesions, the essential point being that outside these lesions we have evidence that all bony tissue is normal. In the generalised disease there is widespread pathological resorption affecting all the bones. In addition there are multiple foci of osteitis fibrosa with or without benign giant-celled tumours and cysts. It is a disease which progresses with pain, fractures, and disabling deformities and is usually fatal. The history of the generalised disease follows.

In 1877, close upon the discovery of osteitis deformans, von Langendorff and Mommsen[59] described the case of a man of 39, thought to be suffering from osteomalacia, but whose bones at necropsy showed softening, multiple fractures, and cysts.

In 1886 Virchow[60] described a case of bone disease showing "tumours and cysts with curving of the femora and porosity of the ribs." In 1889 Hirschberg[61] described a generalised skeletal disease which he separated only imperfectly from osteomalacia. In a Festschrift written in 1891 in honour of the seventy-first birthday of Virchow, von Recklinghausen[62] gave the first accurate description of the disease entity which now goes by his name. His contribution to the Festschrift is very involved, for he describes more than one bone disease. There can be no doubt, however, that his Cases 5 and 7 constitute the discovery of generalised osteitis fibrosa. It is important for us to notice that he went to the trouble of describing two cases of puerperal osteomalacia (Cases 8 and 10) in order to place on record that "so many facts differentiate Case 7 from true osteomalacia."

Case 5 of von Recklinghausen. Extensive fibrous or deforming osteitis with tumours and cysts.—A woman of 66 died of pneumonia, history unknown. Deformities of both femora. Cysts and fibrous areas in femur, tibia, humerus, ulna, occipital bone, and in a few short bones. "There is so little osteoid tissue, the soft connective tissue is so rarely rich in cells, and the cyst wall so resembles old sclerotic connective tissue that we conceive the whole process as an arrested phenomenon, finished years ago."

Case 7 of von Recklinghausen. Osteitis fibrosa with marked bone softening and multiple osteosarcomata.—A man of 40, thought to be suffering from osteomalacia, had fallen from a ladder and fractured neck of femur 18 months before. Six months later spontaneous fractures of clavicle and opposite femur. Severe bone pains. Bowing of humerus, femur, and tibia. Became bedridden and emaciated, and died of exhaustion.

Necropsy: Femora show S-shaped deformity and are bendable. Pelvis beak-shaped. Brown-red projecting tumours (giant-celled myeloid tumours) in fibula, iliac crest, rib, upper and lower jaws. "With a saw the bones cut like rotten wood, the shafts can be cut with a knife using moderate force. The bone cortex is yielding and is everywhere finely porous. Thorough transformation of the essential bone tissue has affected nearly the whole of the spongiosa in all the bones of the trunk and long bones, but has been limited to just a few bony spicules in the feet. Although the new tissue is much behind the normal bone tissue in solidity, it appears perhaps more as an incomplete bony substance and might be described as a tough connective tissue which is in that state which precedes bone. These are the real causes which have led me to the designation osteitis fibrosa osteoplastica."

In our subsequent knowledge of this disease there is ample clinical and pathological evidence to establish the benign nature of these giant-celled tumours. The cells themselves are similar to the osteoclasts normally present in Howship's lacunæ.

Thirteen years after von Recklinghausen first described generalised osteitis fibrosa, an important step was made towards solving the problem of its ætiology. This was the description by Askanazy[6] in 1904 of a case of generalised osteitis fibrosa associated with a parathyroid tumour.

Askanazy's case with parathyroid tumour. Deforming osteitis without osteoid tissue.—Woman, aged 51, complained of pains in limbs. There had been a spontaneous fracture of the femur seven months before. This was treated for five months but remained ununited. On an attempt to put the limb in plaster a spontaneous fracture of the tibia occurred. A month later the opposite femur was found to be fractured. There was great wasting, and the patient died from exhaustion.

At necropsy "to the left of the left thyroid lobe there is a soft tumour (4·5 by 2 by 2 cm.) which looks almost like a second left thyroid lobe. Histologically it is markedly different from the thyroid and consists of narrow strands of cubical epithelium. Nowhere is there formation of colloid. One must think of a parathyroid origin of this tumour." Calvaria easily compressed like a thick mass of rubber; thin sections are easily obtained with a razor. Pelvis heart-shaped. Femur fractured in three places; a knife easily penetrates it. Ribs, sternum, and vertebræ easily compressible; thin corticalis and wide-meshed spongiosa. Microscopically there is "an alternation of

leposition and destruction of bone. We entirely failed to lnd osteoid tissue. Nowhere did halisteresis form part of he disappearance of old bone. The process of destruction f old bone is carried out by numerous osteoclasts lying in Howship's lacunæ. Sometimes one sees a small bony particle surrounded by giant cells, and finally only the steoclasts, single or in groups, free in connective tissue."

Since its significance was scarcely suspected, the arathyroid tumour mentioned by Askanazy in this ase passed unnoticed. However, the description by Erdheim [64] in 1907 of three cases of osteomalacia ssociated with enlargement of the parathyroids alled forth many other observations of bone disease ssociated with hyperplasia or tumour formation in he parathyroid glands.

In 1925 Hoffheinz,[65] rejecting all cases where the nlargement of the parathyroids was indefinite or nadequately described, collected from the literature 5 cases with *measurable* enlargement of one or more arathyroids. Of these, 27 were associated with efinite bone disease, including 17 of generalised steitis fibrosa, 8 of osteomalacia, and 2 of rickets. ometimes more than one parathyroid gland was ffected. He quoted increases of size up to 7 by 5 by 1 cm. The histological changes were either hose of hyperplasia or of adenoma.

Prof. H. M. Turnbull has kindly allowed me to uote from his records of 1917 the following ase :—

CASE 3. *Generalised osteitis fibrosa with parathyroid denoma.*—A man of 66 years (L. H., Reg. No. 15265, 1916). atient was a retired police officer. For two years he had een to some extent disabled by pains in various joints nd was told he had rheumatoid arthritis. For three months e had had attacks of acute pain in the left thigh. On the ay of admission, while sitting on his bed, he heard a snap nd noticed his left leg drop. Examination showed a ontaneous fracture of the left femur at the junction of he middle and upper thirds. No deformity was noticed the skull or other bones. Radiograms of the left femur owed "atrophy of bone" with fracture through a cystic ea. Two weeks later, while tying a parcel, the patient oke the proximal phalanx of the right middle finger. hree days after this accident death occurred from pul- onary embolism.

Necropsy (P.M. 1/1917). Prof. H. M. Turnbull. *Pul- onary embolism; thrombosis of left iliac veins; osteitis rosa diffusa with cysts and small red tumours; parathyroid denoma.* Œdema and chronic emphysema of lungs. iescent tuberculosis: calcareous nodules in lower lobe left lung and gland of tracheal bifurcation. Hypertrophy urinary bladder. Adenomyoma of prostate. Tubular enomyoma in ileum. Considerable general atheroma. rophy of thyroid, liver, kidneys, spleen, testicles, and ntoparietal cortex.

Right superior parathyroid body. Macroscopic.—The gland s enclosed in a fibrous capsule, measured 2 cm. in dia- ter, and was attached to the back of the upper pole of right lobe of the thyroid. On section it felt gritty, and ar fluid escaped from a yellowish cut surface.

Microscopic.—The capsule consists of collagenous tissue, ich is mostly hyaline and extensively calcified. In fts in the capsule and in the areolar tissue outside it are ew glandular acini. Within the capsule the glandular ue is traversed by capillary and larger vessels, with llen walls of hyaline collagen. Calcium frequently egnates the wall and converts many vessels into careous trabeculæ or laminated spheres. In places the ndular tissue is definitely acinar, rows of single cells losing round or oval lumina; usually the cells are in ses interrupted by many small clefts and spaces, or n anastomosing trabeculæ which enclose large irregular symmetrical spaces. The lumina and spaces contain ads or sheets of albuminoid coagulum. The cells are ally polygonal from mutual compression, and measure ut 12 micra in mean diameter. Their cytoplasm is tly acidophil, granular, and vacuolated; cell membranes ally form a sharp line between adjacent cells. There a few smaller cells, with more homogeneous cytoplasm pyknotic nucleus. Preparations to demonstrate fat and ogen were not made.

emarks.—The fact that part of the gland lies in outside the capsule suggests that the whole d was not equally affected. This is possibly in our of benign neoplasm as against functional ertrophy.

Bones. Macroscopic.—Paired cysts above centre, and immediately below centre of left femur (Fig. 4A).* Single cyst in outer condyle of left femur, and in tuberosity of right humerus. Multiple cysts in proximal phalanx and in metacarpal of right middle finger. Fractures through cysts in centre of left femur and proximal phalanx of right middle finger. Areas of red tissue in spongiosa of third right metacarpal, and (2·5 by 2 cm.) in inner condyle of left femur; nodule of firm yellow and grey tissue expanding third right rib (Fig. 4C); red and grey tissue in medulla of left femur below fracture; nodule of red tissue containing small cysts and expanding sixth right rib (Fig. 4B). Nodule of closely meshed, stout-trabeculated, spongy bone slightly expanding the third left rib; nodule of closely meshed, delicate, spongy bone surrounding small areas of red tissue and expanding ninth right rib. Similar compact spongy bone in medulla of third right metacarpal and in bodies of lumbar vertebræ, most extensive in fifth. Coarse grey trabeculæ (bone bordered by fibrous tissue) in spongiosa of sternum, ribs, and necks of femora. Great resorption of spongiosa and corticalis in sternum and ribs. Porosity of corticalis, almost complete resorption of trabeculæ in medulla, and great reduction of spongiosa in femora and humeri. Thin calvaria of close spongy bone. Fragility of ribs. All bones gritty. Anterior curvature of cervico-thoracic spine. Depression in thorax along anterior axillary line; Harrison's sulcus. Excess of red marrow in femora and humeri; red marrow in vertebræ, ribs, and sternum.

Microscopic.—Portions from the margins of the cysts in the left femur and right humerus, from the medulla of the upper extremity of the shaft of the right humerus, and the nodule in the third right rib were embedded without decalcification; portions from the other three expanded ribs, the relatively normal fifth right rib, and the body of the fifth lumbar vertebra were lightly decalcified in nitric acid; portions of the lower end of left femur, with red nodule, the manubrium and sternum were decalcified in formalde-hyde followed by Müller's solution. Sections were stained by Kossa's and other methods.

Fibrous tissue is found about the cysts and throughout the soft and bony nodules described above; throughout the area of abnormally dense spongiosa in the fifth lumbar vertebra, and within eroded spaces in trabeculæ and round several trabeculæ in its more normal spongiosa; in places beneath the periosteum, within eroded spaces in the corti-calis, on portions of the inner surface of the corticalis, and ensheathing medullary trabeculæ in the manubrium, sternum, relatively normal fifth right rib, and the portions of the other ribs that are beyond their expansions; it even ensheaths the few remaining fragments of trabeculæ in the marrow of the upper part of the shaft of the right humerus.

The fibrous tissue consists of spindle fibrocytes, with long fibro-glia fibrils, in a matrix of abundant collagenous fibrils. It varies considerably in density and cellularity, but is in general uniform and well differentiated. Vessels are usually numerous and resemble in structure those in the unaltered marrow, except that the capillaries tend to be wider. In the centres, however, of the larger areas of fibrosis that are free from bone, the capillaries are small and scanty. Here there is a peculiar patchy degeneration, characterised by extravasation of red corpuscles, deposition of fibrin, and fibrinous imbibition of fibrocytes and of collagen fibres. This change characterises the "red tumours." Other changes in the neighbourhood of the cysts are œdema, hæmorrhage, and dilated capillary spaces containing few or no red corpuscles. Groups of cells loaded with iron are frequent, especially in yellow areas. The cysts have almost invariably an even margin, lined with flattened cells. The wall of the largest consists of dense hyaline collagenous tissue; in the others it is not specialised, but sometimes is hæmor-rhagic or contains a zone of osteoclasts or of delicate trabeculæ of coarsely fibred bone. Most of the red areas of fibrinous degeneration contain very numerous osteoclasts, and resemble osteoclastomata. Elsewhere osteoclasts are seldom numerous except near bone.

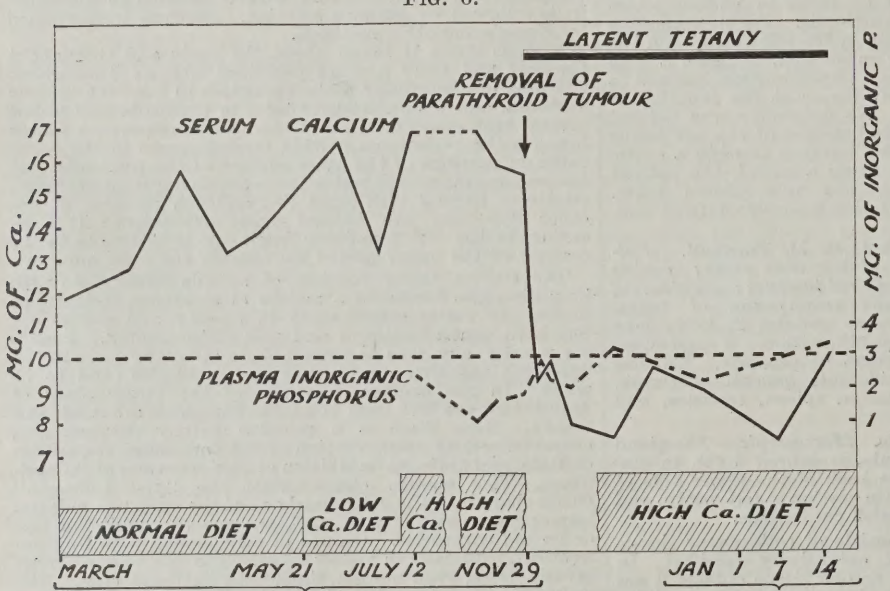
The areas of abnormally dense spongiosa in the ribs and lumbar vertebra consist almost entirely of coarsely fibred bone, and of lamellar bone deposited upon cores of coarsely fibred bone. Active deposition is shown in places by osteoid zones covered by osteoblasts, but there is also much active resorption by osteoclasts in Howship's lacunæ. In the remainder of the spongiosa of the lumbar vertebra there are a few small deposits of coarsely fibred bone and a very few osteoid zones covered by osteoblasts. The predominant feature here is resorption of old lamellar bone. Past resorption is shown by replacement of Haversian canals by wide spaces within trabeculæ and by the tenuity and the eroded surfaces of the trabeculæ. Active resorption

* In the Museum specimens from which the painting was made the posterior and anterior upper fragments of the fractured and bisected femur have been mounted respectively upon the anterior and posterior lower fragments.

is shown by numerous osteoclasts in lacunæ. In the manubrium, sternum, fifth right rib, and the other ribs beyond their focal expansions, formation of new bone is still less, and past and present resorption is greater. The corticalis has been extensively converted into substantia reticularis or has been reduced to a thin shell. The spongiosa has been reduced to a few attenuated "mouse-eaten" trabeculæ. In the spongiosa of the upper end of the shaft of the humerus the trabeculæ are reduced to a few small fragments. The depth of the osteoid zones is seldom greater than in the ribs of newly born infants and is never greater than in healing fractures in healthy adults.

Remarks.—There is a widely disseminated fibrosis of the type found in osteitis fibrosa. Coarsely fibred bone of the kind met is abnormal in an adult. It has, therefore, been formed during the disease. Further, coarsely fibred and lamellar bone were being formed at the time of death. Consequently, formation of bone is a feature of the pathological process. Abundant formation of new bone, however, is found in only a few focal areas, and here it has been preceded by complete, or almost complete, resorption of normal bone. In the skeleton as a whole resorption before, and at, the time of death preponderates enormously over apposition. Resorption is the characteristic feature. The depth of the relatively few osteoid zones that are present is within the limits of the normal. There is, therefore, no histological evidence of the cessation of calcification which characterises rickets and osteomalacia, nor of a removal of calcium by chemical solution. The reduction of calcium in the skeleton is due to the lacunar resorption of calcified bone by osteoclasts. (H.M.T.)

FIG. 6.



Chemistry of the blood in hyper-parathyroidism: effect of removal of parathyroid tumour (Case 4). The blood was examined at intervals for nine months before and for two months after operation. The low calcium diet was that given during the investigation of the calcium balance. The high calcium diet was unweighed. It included four pints of milk daily, together with ice cream, cheese, and eggs. The presence of Chvostek sign has been charted as latent tetany.

Relation of Parathyroid Tumour to Changes in Bone.

Meanwhile there was a difference of opinion as to whether the parathyroid tumour was primary or secondary in relation to the bone disease. Erdheim[64] himself defended the view that the disease of the skeleton was the primary factor, and that skeletal decalcification created such a demand for calcium that a compensatory hypertrophy of the parathyroids occurred. Against this is the fact that, in generalised osteitis fibrosa, hypertrophy or tumour formation is almost always confined to one parathyroid, whilst the others remain normal. It is true that Klemperer[66] has recorded a case of a parathyroid tumour associated with secondary carcinomatosis of bones. Here the skeletal decalcification seems to be a primary factor and the parathyroid tumour secondary, but this association must be rare and is possibly a coincidence. On account of Erdheim's investigations the question was repeatedly discussed at scientific meetings in Vienna.[67] As early as 1915 Schlagenhaufer, at such a meeting, raised the question as to whether it was not justifiable to attempt the extirpation of a parathyroid tumour in cases of generalised osteitis fibrosa. Maresch supported this suggestion, but it was not until ten years later that Mandl[68] of the Vienna school first performed this operation. In view of the Vienna controversy, it is of great interest that he decided to explore the neck only after treatment by parathyroid transplants and parathyroid tablets had failed to relieve the symptoms.

Mandl's case. Generalised osteitis fibrosa with parathyroid tumour.—A man of 38. History of pains in pelvis and lower extremities for five years. Radiograms showed osteitis fibrosa of femora, pelvis, tibia, and ischium. Treated with parathyroid tablets. Spontaneous fracture of femur; union after two months. Became unable to stand or sit. Noticed heavy white deposit in urine. Four parathyroids from an accident case transplanted into abdominal wall. No improvement. It was therefore decided to explore the neck, though no tumour could be felt. Parathyroid tumour (25 by 15 by 12 mm.) removed at operation. Pains in bones disappeared a few days after operation. White deposit in urine disappeared; urinary Ca excretion dropped to one-eighth the pre-operative value. Three and a half years later no pain. Walks with a stick. Serum Ca 13 to 14 mg. per 100 c.cm. No increase in density of X ray shadows of bones.

HYPER-PARATHYROIDISM.

We now turn to the biochemical aspect of this problem. In 1926 Du Bois[69] investigated the case of a man of 34 with the symptoms and signs of a generalised disease of the skeleton. Radiograms showed extensive decalcification of bones and a large cyst in the right femur. There was hypercalcæmia (serum Ca 15·5 mg. per 100 c.cm.) and a low blood phosphorus (plasma inorganic P 1·4 mg. per 100 c.cm.). Later Aub[70 71] investigated the same case and found that the urinary output of calcium and phosphorus on a low calcium diet was six to seven times greater than was found in normal individuals under identical conditions. He found that these changes in metabolism were equivalent to those of a normal individual receiving 100 units of parathormone daily. It was, therefore, reasonable to suppose that this patient was suffering from hyper-parathyroidism. Unfortunately, exploration of the neck revealed no tumour. However, it was the study of this case and the use of Aub's methods which led to the discovery of many cases of hyper-parathyroidism in the United States and in this country. Meanwhile in Germany, Austria and Holland the work of Mandl was producing the same effect. Fourteen cases have now been published

and I have recorded elsewhere [72] brief abstracts of these.

I will now relate a case [72] which seems to me to place on a firm and irrefutable basis the idea that hyper-parathyroidism is a disease entity, and that the bone changes to which it gives rise are those of generalised osteitis fibrosa.

CASE 4. *Hyper-parathyroidism. Hyperfunction of parathyroid tumour in a case of generalised osteitis fibrosa.*—A married woman of 41 years (L.H. Reg. No. 40173, 1929).

Clinical history—Nov., 1926: Pain in right knee followed by pain in lower part of back and in left buttock, left hip, and back of left thigh. May, 1928: Unable to walk without sticks, pain in lower spine and right knee. Oct., 1928: Attack of right lumbar pain with increased frequency of micturition. No history of having passed calculus or gravel. March 21st, 1929: Operation: Mr. Hugh Lett: Right kidney explored. Pelvis enlarged. No obstruction found. No calculi. Nephropexy performed. July, 1929: Patient walked with difficulty aided by sticks. Sept., 1929: Symptoms worse. Constant pain in lower part of spine and tenderness of forearms and shins on pressure. Nov. 10th, 1929: Patient twisted her left ankle, causing a spontaneous fracture of the neck of the left femur.

Past history: Four children alive and well, one died at four weeks. No miscarriages. In each case labour was normal. No family history suggesting disease of bones.

On examination: Nov. 10th, 1929: A thin, poorly built woman. Calvaria normal size and contour. Sclerotics white. Lenses normal on examination by slit-lamp. Hearing normal. Double dentures. Tongue clean. Mucous membranes normal colour. No thyroid enlargement. No tumour felt in neck. Heart and lungs normal. Blood pressure 140/90. No hypotonicity of muscles. No abnormality in nervous system. Rousseau and Chvostek signs absent. Shortening and version of left lower limb. Great pain on any attempt to manipulate left hip. Pressure upon the shafts of the long bones caused pain. On squeezing the hand there was pain in the heads of the metacarpals. In addition there was a smooth, firm, slightly tender swelling 4 by 1·5 cm. in the lower end of the right ulna.

Urine: Cloud of albumin. Deposit: leucocytes.

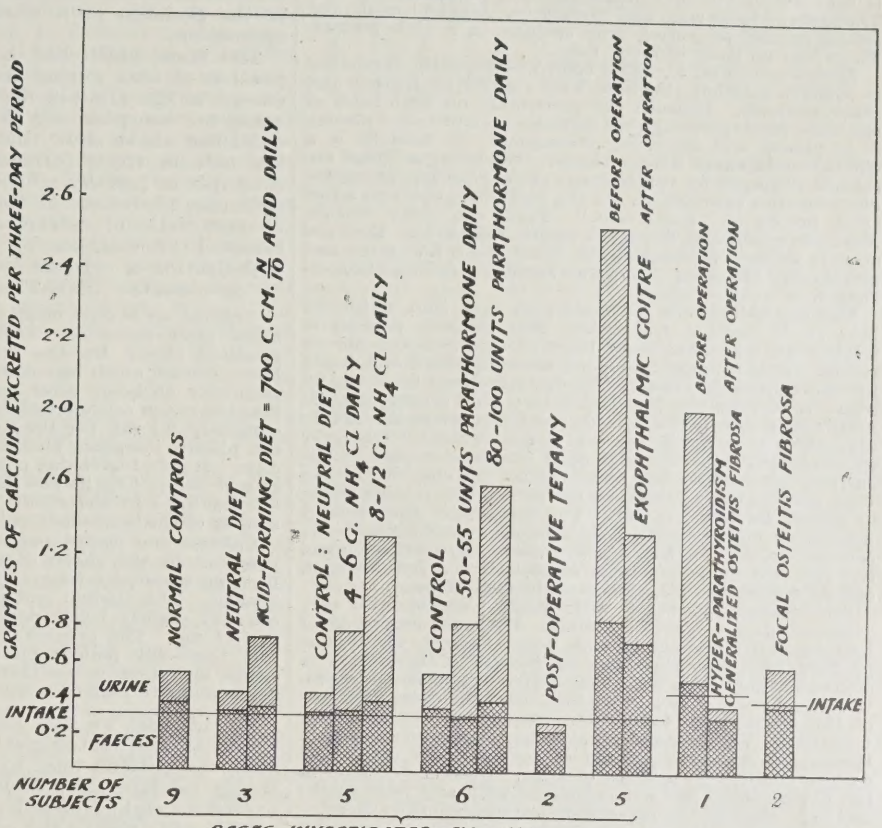
Blood: Bleeding time and coagulation time normal. Wassermann reaction negative.

Radiograms of bones: Greatly diminished density of shadows of all bones examined. This is emphasised by contrast with the bones of a control subject of the same age, sex, and build exposed simultaneously on the same negative. The sacrum, iliac bones, and right ulna (Fig. 5) are specially affected. Pale cyst-like areas, some of them trabeculated, are present in the right ulna, right tibia, right patella, and in many phalanges of the right hand. The left femur is fractured both through the upper most part of the shaft and through the narrowed neck. The calvaria shows a uniform finely mottled appearance (Dr. S. Scott).

Calcium and phosphorus metabolism: There was a constant hypercalcæmia (Fig. 6), the serum calcium reaching as high as 16·7 mg. per 100 c.cm. The corresponding figure for the plasma phosphorus was very low—namely, 1·0 mg. per 100 c.cm. The plasma phosphatase was very high: 1·9 mg. (normal 0·15 mg.). On a known low calcium intake the calcium output in the urine was more than eight times the normal, that in the fæces being approximately normal (Fig. 7).

Operation: Mr. A. J. Walton, Nov. 29th, 1929. A "collar" incision was made in the neck. The left lobe and isthmus of the thyroid were found to be normal. The left inferior parathyroid gland was replaced by a cystic adenoma which was deeply situated in immediate contact with the inferior pole of the left lobe of the thyroid. It was well encapsulated and was removed intact. A portion of bone was removed from the swelling in the lower end of the right ulna.

FIG. 7.



Effects on calcium metabolism of diet, ammonium chloride, parathyroid extract, and disease of the parathyroid and thyroid.

The calcium excretion was estimated on a known low calcium intake. The horizontal lines represent the calcium intake, which was approximately 100 mg. daily. The urinary calcium excretion is represented by single cross hatching and the fæcal calcium excretion by double cross hatching.

Report on specimens removed at operation (S.D. 2806, 1929): Prof. H .M. Turnbull. (1) *Left inferior parathyroid body. Macroscopic.*—The specimen was pyriform, tense, and fluctuating, and measured 3·7 by 3 cm. (Fig. 8). On section a slightly opaque, blood-stained fluid escaped, and the specimen collapsed. The wall consisted of a thin membrane to the greater part of which was attached a lining of opaque, pale ochreous tissue. This was 0·8 cm. at its thickest, contained cystic cavities and was broken on its mesial aspect into ragged trabeculæ.

Microscopic.—The gland is surrounded by a thin capsule of dense collagenous fibrous tissue, and contains numerous large and a few small cysts. These have smooth margins without any reticular or other lining, and are filled with an albuminoid coagulum and occasionally red corpuscles. Between the cysts a mass of mutually compressed cells is traversed by numerous capillaries and a few arteries and veins. Small alveolar spaces are very rare. The cells and their nuclei resemble those of a normal gland. They vary in size, but the mean size is decidedly larger than normally. The cytoplasm is finely granular or vesicular, occasionally coarsely vesicular; a linear cell-membrane usually separates adjacent cells. Groups of cells, particularly near the margins of cysts, are loaded with anisotropic lipoid. Glycogen is present in many cells, but is usually scanty and confined to

the periphery. There is no collagen, fibroglia, or reticulum apart from the walls of capillaries and the adventitia of larger vessels.

Remarks.—The appearances indicate a functional hyperactivity rather than an autonomous neoplasm.

(2) *Expanded lower end of right ulna. Macroscopic.*—Slice (1·5 by 1·3 by 0·5 cm.), including both periosteal surfaces. The sawn surfaces were pink and gritty. A hand lens showed closely packed projecting grey spicules in a pink ground. There was no trace of ivory bone.

Microscopic (Fig. 9).—The bone was partially decalcified in Müller's solution. Sections were stained by Kossa's and other methods. Beneath the periosteum on both sides of the bone, passing through the corticalis, completely replacing it in places, and extending throughout the medulla is a cellular collagenous fibrous tissue. The collagen fibres are stained deep red by van Gieson's stain. Spindle fibrocytes are numerous throughout. In the medulla it contains a few small groups of "foam cells." There are many vessels. Most are small, and none is exceptionally wide. Most are sharply defined capillaries, but there are a few veins and arterioles. There are one or two small perivascular hæmorrhages.

The corticalis is for the most part very thin or broken into small isolated trabeculæ. The thickest portion is fretted by numerous deep bays of subperiosteal fibrous tissue. It is composed of both coarsely fibred and finely fibrillated (lamellar) bone. The coarsely fibred bone usually forms a core to the lamellar bone; this arrangement is particularly clear in the thickest portion of corticalis. Active apposition is shown by osteoid zones covered by a layer of osteoblasts, and is found upon the greater part of the surface, particularly the outer surface on one side of the bone and the inner surface on the other. The osteoid tissue is almost entirely lamellar. The margins of the calcified bone show numerous Howship's lacunæ, even beneath the osteoid zones. On the inner surface of the corticalis upon one side are numerous large osteoclasts; a few lie upon osteoid tissue, the others occupy lacunæ in bone.

The medulla is beset with small trabeculæ of very irregular, deeply notched outline. They are composed of both coarsely fibred and lamellar bone. Coarsely fibred bone predominates, but the bone in process of apposition is almost entirely lamellar. This active apposition is shown by osteoid zones covered by a layer of osteoblasts. Portions of the surface free from active apposition are relatively very rare. They almost always show large osteoclasts in lacunæ. Occasionally groups of several large osteoclasts enclose one or two spicules of bone. Other osteoclasts in the fibrous tissue are not connected with any bone in the section. Most of the osteoclasts are exceptionally large.

The depth of the osteoid zones upon the corticalis and upon the trabeculæ in the medulla is obviously very frequently exaggerated by tangential section; tangential section must occur very frequently when the calcified trabeculæ are of such very irregular shape. The shape of the osteoblasts varies with the obliquity of the section. Where the zones are cut at right angles to their surface, the osteoblasts are narrow spindles. Drawings were made of many osteoid zones cut strictly at right angles, and were compared with drawings of osteoid zones in the ribs of infants at and shortly after birth, and in callus in the bones of adults from 13 to 22 days after fracture. The osteoid zones in the present case are slightly deeper than the deepest zones in the normal infants, but are no deeper than the zones in the healing fractures.

Remarks.—The fibrous tissue beneath the periosteum and throughout the bone has the uniform and highly differentiated structure of an osteitis fibrosa as opposed to sarcoma. Coarsely fibred bone is not found in the medulla of a normal ulna at any age, and coarsely fibred bone of the kind present in this specimen is not found in the corticalis of an adult. The coarsely fibred bone is abnormal and has been formed during the disease. It is clear, therefore, that the pathological process has caused the resorption of at least a large part of the original corticalis, and almost all the original spongiosa. At the same time, or subsequently, new, coarsely fibred bone has been deposited, and lamellar bone has been laid upon this. At the time of excision of the specimen, both apposition and resorption were in active progress. The fluctuation in these two processes is shown by the presence of osteoid zones upon Howship's lacunæ, and by the occasional presence of an osteoclast upon osteoid zones which everywhere else are covered by osteoblasts. At the time of excision active apposition predominated over active resorption; and, although past resorption is the most striking feature in the corticalis, it is masked in the medulla by the great number of newly formed trabeculæ. The abundance, however, of newly formed bone in this focal swelling of the ulna cannot be taken as characteristic of the changes throughout the skeleton, in view of what was found in Case 3. In Case 3 an even greater formation of new bone was found in focal areas, but in the skeleton as a whole resorption far exceeded apposition.

The bone which had been formed in the excised portion of ulna during the disease is fully calcified, except in the sharply defined osteoid zones. These zones are conspicuously deep, but the measurements described above show that they are not deeper than the osteoid zones formed in the active healing of fractures in healthy adults. There is no histological evidence, therefore, of the cessation of calcification characteristic of osteomalacia and rickets nor of a removal of calcium by chemical solution. The mobilisation of calcium was due to lacunar resorption by osteoclasts. (H.M.T.)

Progress up to three months after operation.—Twenty-four hours after operation Chvostek sign appeared and has persisted since. On the second day pressure upon the bones caused much less pain than previously. The blood chemistry 48 hours after removal of the tumour showed that the serum calcium had dropped to a level below normal—namely, 9·1 mg. per 100 c.cm. (Fig. 6). Simultaneously the plasma inorganic phosphorus rose to 2·8 mg. per 100 c.cm. By the fourth day pressure upon the bones no longer caused pain. The patient has been kept in bed with the left leg fixed in abduction. In controlled radiograms the density of the bone shadows is the same as before operation.

Calcium and phosphorus metabolism.—Latent tetany has persisted in the shape of Chvostek sign, but there has been no manifest tetany, and Trousseau sign has never been present. The calcium and phosphorus levels in the blood are still slightly below normal. The plasma phosphatase is 1·14 mg. The calcium output (Fig. 7), estimated for four three-day periods on the same low calcium diet as before operation, is less than in the normal individual. It corresponds to that of a case of post-operative tetany.

In this case we may say that clinical, radiological, chemical, and histological evidence combine to show that the patient was, by urinary excretion, rapidly losing calcium salts from the skeleton in amount exceeding eight times the normal.

This gave rise to the complete picture of a disease known to von Recklinghausen 40 years ago, in days when it was impossible to solve the problem of its ætiology. His insistence that the disease was not osteomalacia is borne out by all the additional facts brought to light by our new methods. Unfortunately the literature of the subject shows only too plainly that his work has been largely overlooked, for we find hyper-parathyroidism being confused with osteomalacia in 1929.

Clinical Characteristics of Hyper-parathyroidism.

Of the 14 cases published to date, in nine a parathyroid tumour was removed, in two one or more histologically normal parathyroid bodies were removed,[70 73] and in three there was no operation on the neck.[74 75] The condition is reported twice as frequently in women as in men, the commonest age being 30 and 55. The histological picture of osteitis fibrosa was established in seven cases, and in two of these giant-celled tumours are mentioned. Pain in the bones and spontaneous fractures were common. Polyuria occurred in three cases, and in one of these bilateral renal calculi were found.[76] Hypotonicity of muscles is described in two cases. In nine cases there was no palpable swelling in the neck, but on exploration only two of these failed to show a parathyroid tumour. In these two cases it may be that a tumour was present and was not found. In those cases where radiograms are mentioned there was greatly diminished density of the bone shadows. Sometimes there was radiological evidence of cysts, but these only rarely expanded the corticalis. The serum calcium figures varied between 13·1 and 23·6 mg. per 100 c.cm., the plasma phosphorus between 1·0 and

2·7 mg. The output of calcium in the urine varied from a slight increase to eight times the normal figure.

The tumours removed were usually encapsulated adenomata, often cystic, and measuring about 2·5 cm. in diameter. The largest tumour removed was 5 by 3·5 by 3 cm. and has been described as a malignant adenoma.[77] [78] In the majority of cases pain in the bones was abolished immediately after operation, and the mechanism of this is difficult to conceive. In one case[79] removal of the tumour promptly abolished polydipsia and polyuria. In many cases the levels of the blood calcium and phosphorus and the excretion of calcium in the urine were restored to normal. Sometimes there was temporary hypocalcæmia and even oliguria, with subnormal excretion of calcium in the urine.[80] Latent tetany after operation was common, and manifest tetany often occurred, with marked variations in severity. It was fatal in one case only—namely, that of Beck,[81] where two parathyroid tumours were removed. This is the only case of hyper-parathyroidism recorded in which more than one tumour was found. In Snapper's case[82] tremor and acute mania occurred three weeks after operation, at a time when the serum calcium had dropped to 6·6 mg. per 100 c.cm. The condition was completely relieved in three days by the use of parathormone injections in conjunction with a preparation of calcium given intravenously.

With regard to the later effects of operation it is too early to make a statement. There is no doubt that symptomatic improvement occurs after extirpation of a tumour; eight of the nine patients surviving operation all showed this, and it was possible for some of them to dispense with sticks and crutches. In the two cases where normal parathyroid glands were removed, the hypercalcæmia persisted and little improvement occurred. Considering the generalised and extensive destruction of bone, one would expect complete repair to take many months or years. It is a very different question from osteomalacia or rickets, where osteoid tissue merely awaits conversion into bone by a process of calcium deposition. Some authors claim that an increase in density in the radiographic shadows of bones was to be seen in their cases a few months after operation. It is of great interest that three years after operation no such change could be demonstrated in Mandl's case.

Pathogenesis of Generalised Osteitis Fibrosa (Hyper-parathyroidism).

In view of all these cases there can be little doubt that the essential change in generalised osteitis fibrosa is a removal of calcium from the skeleton owing to parathyroid hyperactivity, the condition being similar to the experimental administration of parathormone to animals. In referring to the skeletal changes the term osteomalacia is frequently used, but there is no histological evidence of true osteomalacia. The calcium is removed by lacunar resorption by osteoclasts. The resorption is widespread, but it is accompanied by focal formation of new bone. In the formation of new bone the osteoid zones are frequently deeper than in the normal bones of adults, but as was shown by Schmorl[83] and independently by Turnbull in the two cases described here for the first time, the unusual depth is merely evidence of rapidity of formation, the greatest depths being no greater than in the healing of fractures in healthy adults.

Focal Osteitis Fibrosa.

Of much more common occurrence than the generalised disease is focal osteitis fibrosa. This is a condition affecting one or more bones, usually not disabling, of slow progress, and showing a tendency to become arrested. It occurs chiefly in adolescence and is often symptomless until spontaneous fracture occurs.

In those cases which I have investigated, the serum calcium and plasma phosphorus and phosphatase have been normal. (Table I).

Table I.

Sex.	Age.	Foci.	Diagnosis.	Ca.	P.	Phosphatase.
F.	18	Multiple.	Radiological.	9·9	3·5	0·248
F.	17	Single.	Histological.	10·5	2·3	0·217
M.	19	,,	,,	9·7	3·5	0·201
M.	24	,,	,,	9·7	3·5	0·219
M.	19	Single (cyst).	Radiological.	9·9	3·8	0·162
F.	30	Single.	Histological.	8·8	3·0	0·179
M.	16	Single (cyst).	,,	9·4	4·3	0·235

I shall now relate a case in which the calcium balance was normal, a finding in striking contrast to that of the generalised disease.

Case 5. *Osteitis fibrosa in multiple foci.*—A married woman of 27 years (L. H. Reg. No. 40007, 1930).

Clinical history.—Twelve months: enlargement of right arm above elbow. Three weeks: aching pain in arm began in fourth month of pregnancy. No fracture nor history of fracture. Two children well.

Calvaria normal. Sclerotics white. Slit-lamp examination showed within the fœtal nucleus of each lens crowds of tiny white glistening dots surrounded by a small area of cloudy lens. No visual defect. No tumour felt in neck. Diffuse irregular enlargement of right humerus with outward bowing in upper part. No deformity of other bones. Wassermann reaction negative. Radiograms of bones: right humerus and radius show pale trabeculated areas with expansion of bone. Similar, less definite areas round acetabulum and in left ischium. Controlled radiograms showed that outside these areas the shadows of all bones were of normal density. The blood chemistry was found repeatedly to be normal (serum Ca 9·8 mg. per 100 c.cm., plasma phosphorus 3·0 mg., plasma phosphatase 0·363 mg.). On a known low calcium intake the calcium output in urine and fæces was normal (Fig. 7).

This is not an isolated instance of a normal calcium balance in focal osteitis fibrosa; I found it also in the first case shown in Table I.

Taken in conjunction with the above observations on the blood of seven other cases, the finding of a normal calcium metabolism is of far-reaching importance. Supported as it is by the normal density of the radiographic shadows of bones, it is evidence strongly against hyper-parathyroidism. It is of vital importance in such cases to realise that, although many bones are affected, the condition is totally different from the generalised disease and that exploration of the neck is clearly unjustifiable.

I shall now go on to discuss the effects of the thyroid hormone and of thyroid disease on the metabolism of calcium and phosphorus.

Effects on Calcium Metabolism of Thyroxin and Thyroid Disease.

It is, of course, known that the internal secretion of the thyroid gland raises the basal rate of combustion of carbohydrate, fat and possibly protein, consequently appreciably increasing the total heat production of the organism. Its effect, however, on inorganic salt metabolism had until about two years ago largely been ignored. Parhon,[84] in 1912, showed a marked loss of calcium in rabbits fed with lethal doses of thyroid, and her work definitely suggests a stimulating effect of the thyroid on calcium metabolism. Kummer,[85] in 1917, studied for 13 days the metabolism of a man aged 42 suffering from exophthalmic goitre. Two and a half litres of milk were given daily, which meant that the calcium intake was approximately 5 g. per day. No determinations were made of the basal metabolic rate, and control figures for calcium were taken from the literature. Because the quantity of calcium in the urine was normal, and that in the fæces was large, he attributed the high fæcal calcium to a difficulty in absorption rather than to abnormal excretion. He concluded that the mineral excretion was high but very irregular, both the calcium and phosphorus losses being especially great.

It is to Aub, Bauer, Heath, and Ropes,[86] however, that we owe an accurate knowledge of the part played by the thyroid in calcium metabolism. Working with low calcium diets they have found that hyperthyroidism is associated with a markedly increased calcium excretion, and that the mechanism by which this is brought about differs widely from that of the parathyroid. They made observations on 16 cases of thyroid disease, and on two normal individuals given thyroid, and in all these cases they found consistent results. In eight cases of exophthalmic goitre the elimination of calcium was 231 per cent. above the average excretion per kilo found in control cases. In one severe case of exophthalmic goitre the calcium excretion was eight times the normal. These increases were out of all proportion to the effect on the basal metabolic rate, the average increase of which was only 55 per cent. above normal. During treatment with iodine, and after subtotal thyroidectomy, as the patient improved and the basal metabolic rate approached the normal, the calcium excretion also returned towards normal.

Additional evidence was furnished by two cases of so-called hyper-functioning adenoma of the thyroid. The calcium excretion was raised to almost twice the normal and fell definitely after the adenomata were removed. The effect of the administration of thyroid was studied in two normal individuals. In one of these gr. 42 of thyroid extract were given by mouth over a period of four days, and on the fourth day 10 mg. thyroxin were given intravenously. Ten days later apprehension, fever, malaise, and tachycardia appeared. At this point the basal metabolic rate had risen to plus 48 per cent., and the calcium excretion was doubled.

These studies clearly show that the thyroid hormone stimulates calcium excretion to an extent far in excess of that produced by acids or even by parathormone.

But if thyroxin increases calcium excretion, then myxœdema may be expected to be associated with a diminished calcium output. This was clearly established by these authors in six cases, where they found the average excretion to be 40 per cent. below the normal. Administration of thyroid to these patients with myxœdema resulted in an increase both in metabolism and in calcium excretion.

Thyroid Treatment of Parathyroid Tetany.

Striking effects were obtained by the use of thyroid preparations in a case of post-operative tetany.[38] Sufficient thyroid extract by mouth and thyroxin intravenously were given to raise the basal metabolic rate from minus 14 to plus 22 per cent. This occurred over a period of two weeks, during which time the blood calcium rose from 6·7 to 11·9 mg. per 100 c.cm. The calcium excretion increased to three-fold its previous value. This increase of calcium in the blood and excreta was still present six weeks after the last dose of thyroid extract, a surprising result which was confirmed later in the same patient. This effect on calcium is not an indirect result of the raised metabolic rate, for the increased calcium excretion reached its height only when the basal metabolism was falling, and this increase was maintained long after the effect on the basal metabolism had subsided. This calcium stimulation, therefore, had a longer latent period and more prolonged effect than any other function of the thyroid yet described.

The effect of thyroid on the blood in this case is quite astonishing, when we recall that the serum calcium values in thyroid disease are normal. In exophthalmic goitre, even though calcium excretion may be eight times the normal, this high rate of elimination is not obvious in the blood, for there is no hypercalcæmia. And yet thyroid treatment has been found to raise the serum calcium in parathyroid tetany!

Action of Thyroid and Parathyroid Contrasted.

As to further contrasts between the thyroid and parathyroid mechanism we notice from Aub's figures[8] in Fig. 7 that, of all the conditions he studied, it was in hyperthyroidism alone that he found a distinct increase in fæcal as well as in urinary calcium excretion. It was also obvious that the fæcal calcium was not unabsorbed calcium, for there was more present in the fæces than was present in the food. Why the fæcal excretion should be increased above this basal level only by the thyroid is very difficult to understand, particularly as the blood calcium in thyroid disease is normal.

In hyperthyroidism a marked increase in phosphorus excretion was also found.[86] This increase was quantitatively such as to suggest that most of the calcium excreted came from tertiary calcium phosphate in bone.

Is the high calcium excretion of hyperthyroidism dependent on the increased thyroid secretion, or is it merely an accompaniment of an increased metabolism? This question was answered[86] by determining the calcium excretion in cases with a high metabolism due to prolonged fever and leukæmia. Three out of four such cases showed a normal calcium excretion in spite of an elevation of general metabolism, varying from plus 21 to plus 41 per cent. We may therefore conclude that an increased calcium excretion is not necessarily a function of a raised metabolic rate alone.

Does thyroxin exert a stimulating effect on the parathyroid glands? The normal blood calcium in hyperthyroidism and after intravenous thyroxin argues against this. But very little is known about the threshold of calcium excretion, and we have pointed out elsewhere[22] that the administration of parathormone may sometimes cause a great increase of calcium excretion without appreciably raising the serum calcium level.

We recently attempted[25] to solve this problem by animal experiments in which the action of thyroxin was investigated after total thyro-parathyroidectomy. In other words, we wanted to know whether thyroxin would increase the calcium output in animals deprived of their parathyroids. We worked with dogs and cats kept in metabolism cages on a low calcium diet. After operation they were allowed to go into tetany, an

GENERALISED OSTEITIS FIBROSA: HYPER-PARATHYROIDISM.

Descriptions of Illustrations on Coloured Plate.

FIG. 4. (Case 3).—Bones (½-scale) in a case of generalised osteitis fibrosa with parathyroid adenoma.

(A) *Left femur.*—Note fractures through cysts in centre of shaft, area of red-brown tissue in inner condyle, and coarse grey trabeculæ of bone bordered by fibrous tissue in spongiosa of neck.

(B) *Sixth right rib.*—Note nodule of red tissue containing small cysts and expanding bone.

(C) *Third right rib.*—Note tumour expanding bone.

FIG. 5. (Case 4).—Controlled radiogram of right forearm in a case of hyper-parathyroidism. The density of the X ray shadows of the bones is contrasted with that of a control subject of the same age, sex and build exposed simultaneously on the same negative. Note the diminished density of the bone shadows and the pale cyst-like areas, some of them trabeculated. The control is marked E.

FIG. 8.—Tumour (actual size) of left inferior parathyroid body removed at operation in Case 4. In the cut section note the relatively large amount of solid tissue. This is functionally hyperactive parathyroid tissue.

FIG. 9.—Histological section of portion of expanded lower end of right ulna removed at operation in Case 4. (Müller's solution; Weigert's iron hæmatoxylin and van Gieson's mixture.) There is fibrous tissue beneath the periosteum and throughout the bone. A large part of the original corticalis has been removed by osteoclastic lacunar resorption. The bone formed during the disease is fully calcified except in the osteoid zones. These are not deeper than those formed in the active healing of fractures in healthy adults.

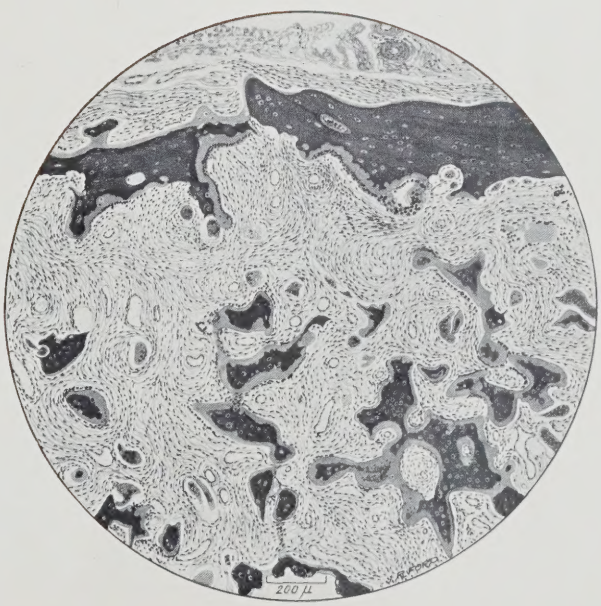
GENERALISED OSTEITIS FIBROSA: HYPER-PARATHYROIDISM.

FIG. 4.

FIG. 5.

FIG. 8.

FIG. 9.



STUDIES IN CALCIUM AND PHOSPHORUS METABOLISM

(DR. DONALD HUNTER).

FIG. 11.

FIG. 12.

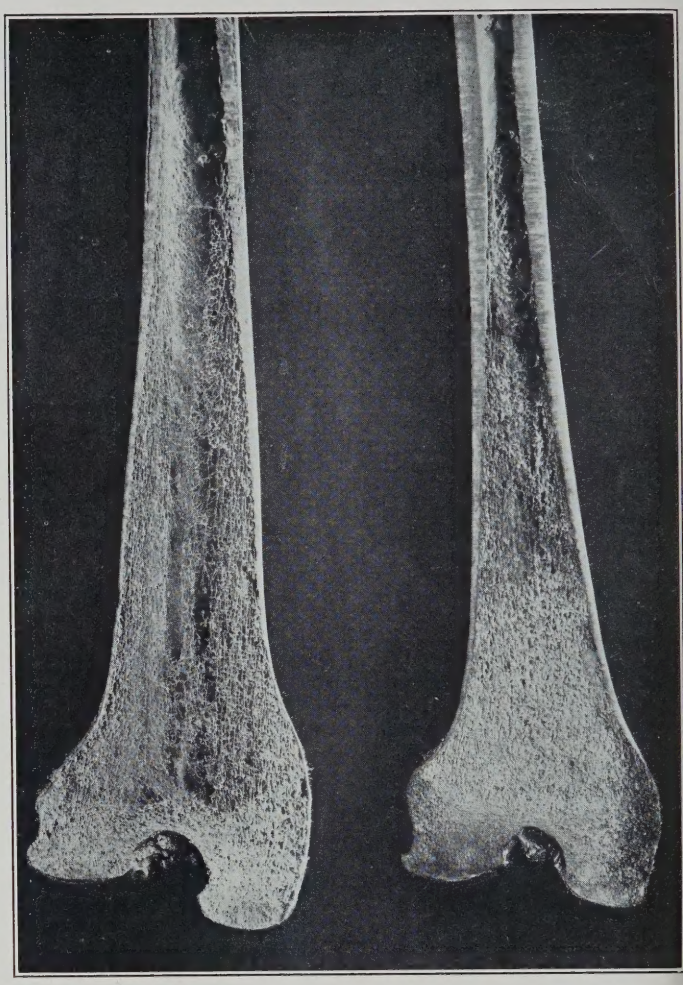


FIG. 13.

then the smallest dose of parathormone required to keep each animal just free from tetany was determined. Subsequently large doses of thyroxin were injected every second day, and the dose of parathormone was kept constant. In the case of the cats the experiment was a complete failure; thyroxin made them ill and they died in tetany. The dogs were more satisfactory, but a gradual drop in the serum calcium with the appearance of tetany ten days after the last dose of thyroxin made us decide that the conditions of the experiment were too exacting upon the available stores of calcium. We intend to repeat the experiment with intervals of high calcium therapy, during which, of course, we shall lose our observations on calcium balance.

The alternative explanation—namely, that the thyroid exerts a direct effect on bone katabolism—is not an unlikely one, especially as this would be in agreement with the general action of thyroid on other body tissues.

Radiographic Studies of Bones in Exophthalmic Goitre.

The studies of Kummer [85] on the metabolism in exophthalmic goitre led him to the conclusion that the calcium excretion was high in this disease. He was apparently the first to make the exceedingly interesting observation that "as judged from radiograms this calcareous demineralisation affects the bony system." In 1927 Bernhard,[87] investigating a case of exophthalmic goitre in a woman of 47, described radiograms showing poverty of calcium in the bones.

Aub and his co-workers[86] observed independently the same phenomenon. They took controlled radiograms of the hands of a patient with exophthalmic goitre of 17 years' duration and demonstrated marked poverty of calcium in the bones.

In their paper they point out that the change is unlikely to be a constant finding in hyperthyroidism, since adequate calcification of the bones should be possible in cases where the diet contains sufficient calcium.

Plummer and Dunlap [88] found radiographic evidence of severe osteoporosis in three cases of hyperthyroidism, in two of which carcinomatosis of the bones had been suspected. An autopsy on one of these cases revealed generalised osteoporosis, especially of the calvaria and ribs, the latter showing multiple fractures. No histology is recorded. These authors state their belief that the process of decalcification of bone in hyperthyroidism is usual.

In our experience controlled radiograms of the bones in exophthalmic goitre reveal poverty of calcium in less than half the cases examined (Fig. 10). In two cases of hyperthyroidism with spontaneous fracture we have found radiographic evidence of decalcification not only of the fractured bone but also of all other bones examined.

Chemistry of the Blood in Exophthalmic Goitre.

The demineralisation of bone seen in radiograms is, in fact, a widespread osteoporosis brought about by osteoclastic lacunar resorption. Before demonstrating this it will be of interest to inquire into the values found for the plasma phosphatase in cases of exophthalmic goitre. It has already been emphasised that the serum calcium and plasma inorganic phosphorus are consistently normal in hyperthyroidism. The phosphatase values in the plasma are often high, though the increase is neither so great nor so consistently present as in the case of osteitis deformans. There seems to be no relation between the duration of the disease, the degree of osteoporosis, and the values for the plasma phosphatase (Table II.).

TABLE II.

Sex.	Age.	Duration in years.	Osteoporosis in radiograms.	Ca.	P.	Phosphatase.
F.	66	18	Severe.	9·0	3·3	0·260
F.	21	3	Slight.	9·2	4·0	0·430
F.	30	3	Considerable.	8·8	3·8	0·446
M.	25	1	Slight.	9·7	4·3	0·448
F.	50	15	Slight.	9·7	3·8	0·221
F.	48	2	Absent.	9·8	3·3	0·525
F.	24	3	Slight.	9·9	3·0	0·380
F.	40	4	Absent.	9·1	3·3	0·189

OSTEOPOROSIS IN EXOPHTHALMIC GOITRE.

In view of the chemical and radiographic studies just described it became a matter of importance to examine the bones in exophthalmic goitre. Cases 6 and 7 serve to show that severe generalised osteoporosis may be found in hyperthyroidism of many years' duration.

A search of the literature revealed the fact that this condition was known to von Recklinghausen and Askanazy, though they had no means of determining the true relation between the thyroid disease and the osteoporosis.

Case 12 of von Recklinghausen.[62] (See also Koeppen.[89]) *Juvenile osteomalacia with Basedow's disease.*—A single woman of 23, dressmaker in Strassburg. There had been no puerperium. Five years' history of goitre, prominence of eyes, and palpitation. Two years before: pain in back brought to her notice that her spine was twisted. Later, pain in both arms, sometimes cramps in hands and feet. On examination: exophthalmos, tremor, tachycardia, enlarged heart. Slight kypho-scoliosis. Trousseau sign absent.

Necropsy: great enlargement of thyroid and thymus. Hypertrophy of heart. Several of the bones are marked by uncommon redness for that age, especially the cortices of the long bones, which are everywhere marked longitudinally with vascular striæ. In the calvaria, scapula, and iliac bone there are definite vascular striæ. All the bones saw like rotten wood, the sternum and calvaria being readily cut with a knife. Maceration revealed numerous small exostoses corresponding to the insertions of tendons. Histologically, resorption spaces were abundant in the corticalis, and they often contained whole nests of osteoclasts.

A comment is made that the degree of osteoclastic resorption was equalled only by that found in Case 7 (generalised osteitis fibrosa). Both authors describing this case believed that the bone changes were secondary to the exophthalmic goitre, but they expressed a doubt as to whether this form of "osteomalacia" was identical with the ordinary puerperal form.

Askanazy's case with thyroid tumour.[90] *Calcium metastases and progressive atrophy of bone.*—A woman, aged 54. History of goitre for five years, no pressure symptoms. Thirteen months before, she had been in bed with sacral backache following a fall. Three weeks before: renal colic, passed two calculi. Died of suppurative pyelonephritis.

OSTEOPOROSIS IN EXOPHTHALMIC GOITRE.

Descriptions of Illustrations on Coloured Plate.

FIG. 11. (Case 6).—Right femur (actual size) in a case of exophthalmic goitre. The perfectly homogeneous ivory-like corticalis which is seen in the normal bone is here interrupted by many pink longitudinal narrow streaks and rows of dots.

FIG. 12.—On the left is seen a macerated specimen of the left femur in Case 6. It has been sawn longitudinally and digested in pancreatic solution. Note the pitting of the corticalis and the conversion of the spongiosa into an exquisitely delicate lace of fine bony threads. On the right is a control specimen of the left femur from a healthy subject of the same age and sex, prepared in the same way.

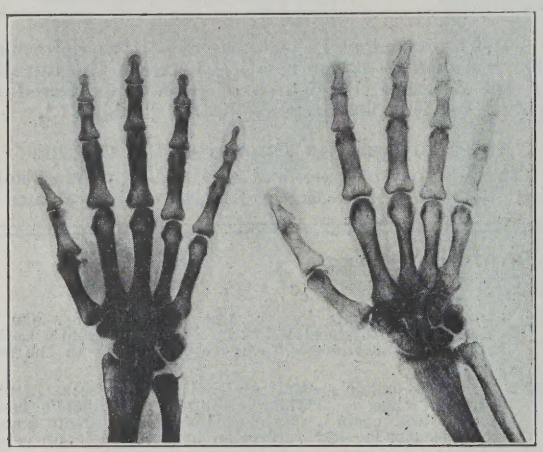
FIG. 13.—Histological section of corticalis of centre of right femur in Case 6. (Müller's solution; Delafield's hæmatoxylin and eosin.) Subperiosteal area. Note general osteoporosis, lacunar resorption by osteoclasts, an osteoid zone, and perforating canals.

At necropsy: large retrosternal goitre which had become carcinomatous and had given rise to metastases in the lungs. Multiple calcified areas in lungs, one in gastric mucosa. Purulent pyelitis with renal calculi; perinephric abscess.

"On palpation of the ribs at their angles a few small exostoses were felt. The spongiosa of the ribs was wide-meshed. In the spongiosa of the vertebræ also there were spaces up to the size of lentils. The bony spicules could be pressed in more easily than usual. In the macerated vertebræ the spicules, both in the bodies and in the laminæ, were like bony threads."

Sections were made from spine and sternum. The histological picture revealed resorption of bone of greater

FIG. 10.



Controlled radiogram of hand showing osteoporosis in exophthalmic goitre. (From the first case in Table II.)

The density of the X ray shadows of the bones is contrasted with that of a control subject of the same age, sex and build exposed simultaneously on the same negative. The diminution in density of the bone shadows is uniform. There are no pale cyst-like areas.

severity and extent than could have been predicted from the macroscopic appearance of the bones. "The picture in every section examined was striking and beautiful. One has rarely observed in so dramatic and extensive a way the pure uncomplicated process of progressive bone resorption by osteoclasts. Innumerable typical osteoclasts lay in lacunæ in the bone, and lacunar resorption was universal. In many fields I could count 40 to 80 osteoclasts lying in an uninterrupted row." Occasionally apposition of new bone in narrow layers was observed, but by no method of fixation or staining could osteoid tissue be demonstrated.

CASE 6. *Osteoporosis in exophthalmic goitre.*—A girl of 19 years (L. H. Reg. No. 23935, 1928).

Clinical history.—Patient was a factory hand. For five years she had noticed breathlessness, palpitation, loss of weight, and prominence of the eyes. For 10 months there had been gradual enlargement of the neck, and she became unable to work. Weight, 106 lb. 5 oz. Height 5 ft. 7½ in. Fine tremor, exophthalmos, and great enlargement of the thyroid. Pulse 120, regular. Heart hypertrophied, with a thrusting apical impulse displaced 1 in. to the left. Treatment with iodine reduced the pulse-rate to 100. At operation the isthmus and right lobe of the thyroid were removed. Death occurred 21 hours later.

Summary of necropsy (P.M. 469/1928). Prof. H. M. Turnbull. *Broncho-pneumonia. Operation: removal of isthmus and right lobe of thyroid. Graves's disease.* Cellular hyperplasia and focal lymphocytic infiltration of thyroid gland. Hypertrophy of thymus (47·5 g.). Moderate exophthalmos. Exceptionally abundant lymph-adenoid tissue throughout body. Hypertrophy of myocardium. Focal areas of necrosis and fibrosis in right papillary muscle of mitralis. Large area of organised pericarditis upon right ventricle. Fatty degeneration, microscopic central focal necroses, and considerable portal fibrosis of liver. Slight fatty degeneration of kidneys. Osteoporosis.

Bones. A. Macroscopic examination.—The right femur, right humerus, left radius, and left ulna were sawn in longitudinal section. In no bone was the corticalis appreciably thinner than normally; that of the femur was 0·7 cm. thick. But the perfectly homogeneous ivory-like cut surface which is seen in the normal bone was interrupted by many pink longitudinal narrow streaks and rows of dots. These were especially numerous in the femur (Fig. 11).

B. Macerated specimen (Fig. 12).—The left femur, sawn longitudinally and macerated, was compared with a similarly prepared left femur from a healthy subject of the same age and sex. The femur measures 46·5 cm., is 6·1 cm. longer than this control and is greater in every external measurement; otherwise there is no difference in gross and fine structure externally. In spite of its greater size it is astonishingly light in comparison with the control (dry weight 206 g., control 291 g.). Internally the corticalis is thicker than in the control at the junction of the neck with the internal surface of the shaft. It is considerably thinner in the middle third of the shaft, and much thinner in the lower third. The thick area in the neck is so pitted as to be almost spongy in texture. In the upper two thirds there is a row of pits forming a vertical groove close beneath the surface, and internal to this are many scattered pits. In the lower third alone does the corticalis show the ivory-like surface of the control. The medullary cavity is greatly enlarged, 12 cm. of the upper half of the shaft being entirely free from trabeculæ in comparison with 3 cm. just above the centre in the control. The architecture of the spongiosa is not altered, but the trabeculæ are much more slender throughout and, except in the anatomical neck and condyles, form an exquisitely delicate lace.

C. Microscopic examination.—A longitudinal slice of the corticalis from the centre of the femur was fixed in 4 per cent. saline formaldehyde and transferrred to Müller's solution. It was later split; one half was treated with Müller's solution alone, in the other half decalcification was hastened by a drop of nitric acid. Both pieces were cut and sections were stained by Kossa's and other methods.

The corticalis of a large long bone in a normal subject of ten years or over consists of a compact mosaic of lamellar systems traversed by vessels. Most of these vessels run in the long axis of the bone in Haversian canals surrounded by Haversian lamellar systems. Uniting these are a few transverse or oblique vessels, either in Haversian canals or in perforating canals. Haversian spaces are very rarely met.

In the present case the corticalis consists of a substantial reticularis (Fig. 13), instead of a substantia compacta. A net of trabeculæ of lamellar systems encloses medullary spaces, of which the longitudinal axis is the greatest. The general arrangement of the spaces corresponds to that of the vessels in a normal bone. Almost all the Haversian canals and systems have disappeared; there are several perforating canals (Fig. 13). The trabecula immediately beneath the periosteum is narrow, and it shows several large and small subperiosteal bays filled with a vascularised, delicate fibrous tissue. The largest medullary space lies immediately beneath this and traverses the whole 1·8 cm. of the section. The medullary spaces contain hæmatogenous marrow. The boundaries of many of the spaces show very numerous Howship's lacunæ, many of which are occupied by osteoclasts (Fig. 13). Very few of the trabeculæ show an osteoid zone (Fig. 13); the depth of such zones is within the limits measured in the ribs of newly born infants. The trabeculæ are otherwise fully calcified.

Remarks.—The compact tissue of the cortical has been greatly rarefied by osteoclastic lacunar resorption; there is no histological evidence of cessation of calcification such as is found in rickets and osteomalacia nor of a removal of calcium by chemical solution. The macerated specimen shows that this resorption is not confined to the corticalis but is apparently greater throughout the spongiosa and medullary cavity. (H. M. T.)

This is not an isolated instance of osteoporosis occurring in exophthalmic goitre; we have observed it in other cases, of which the following is an example.

CASE 7.—*Osteoporosis in exophthalmic goitre.*—A single woman of 28 years (L. H. Reg. No. 24678, 1929). History of five years' swelling of neck, nervousness, loss of weight, palpitation. Weight 75 lb. 19 oz. Height 5 ft. 3 in. Enlarged thyroid, marked exophthalmos, fine tremor. Pulse 120, regular, fell to 80 on treatment with iodine. Died five hours after partial thyroidectomy.

Osteoporosis is so severe that the spongy bone in the lower end of the femur exists only in patches. The trabeculæ composing this spongiosa are fine bony threads readily crushed on slight pressure. The corticalis is only slightly affected. The femur is 44·4 cm. long and, after maceration, its dry weight is 226 g. The femur of a healthy woman, aged 22 years, was similarly prepared. Its weight is 378 g. and its length 46·0 cm.

Neither atrophy from disuse nor senile osteoporosis can enter into these observations, for these patients had been up and about until a few weeks before death, and were essentially youthful.

Hyperthyroidism differs from hyper-parathyroidism in that there is no increase of calcium in the blood. But calcium is removed from the skeleton in both, and in both the mechanism of removal is a lacunar resorption by osteoclasts.

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BRITISH HUMANE ASSOCIATION.—Last year this ociation gave free light and electrical treatment to 3,000 persons. A supplementary clinic is to be opened the benefit of those who can pay the ordinary fee. The titution, which controls the London Light and Electric nic, was founded and endowed by the late Mr. Campbell-hnston, but the death duties have made such serious oads upon the endowment fund that the develop-nt schemes prepared by the founder must remain in eyance unless more money is forthcoming. At the nual meeting of the Association held recently Lord rbrough, Sub-Prior of the Order of St. John of usalem, explained that upon the founder's death last r its control passed to the Order.

END-RESULTS OF MANIPULATION OF THE BACK.

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A CONSIDERABLE number of the patients who attend a general hospital complaining of pain in the back are sent to the orthopædic department, often after previous investigation by a urologist or gynæcologist. In the Orthopædic Department at Middlesex Hospital, under Mr. Blundell Bankart, many of these cases are treated by manipulation of the back. At the end of 18 months as registrar in this department I have tried to obtain some statistical record of the results of this form of treatment. Although various writers have recorded the results of their operative or other treatment of these disabilities, there appears to be no similar record of the results of manipulation. The object of the present inquiry has been to ascertain the final results of manipulation of the back, and to show its possibilities and limitations in the different conditions which give rise to what American writers have termed "low back pain."

Material Available.

The records of the clinic have been examined from 1921 to October, 1929. During this period 113 patients have undergone manipulation of the back; ten were so treated in the years 1921–25, and 103 from 1925 to October, 1929. Most of the patients have been re-examined, and to all of them a questionaire has been sent. Replies were received from 78 (69 per cent.); one patient had died from other disease, and in two cases the information obtained was inadequate. There remain 75 cases on which these statistics are based, the earliest having been treated in 1921, the latest in October, 1929.

Every patient was asked whether, as the result of manipulation, the condition of the back was cured, improved, unchanged, or worse. Other questions related to duration of after-treatment, length of time off work, both before and after manipulation, and whether there had been any return of pain. It is realised that the answers to such questions vary with the type of patient, and in particular that the term "improved" requires further definition. Such an answer has therefore not been accepted unless the patient has returned to full work and is not getting any more than occasional pain after over-exertion. In this way several patients who expressed themselves as "improved" have been classified finally as "unchanged."

TABLE I.—*Total Cases Manipulated.*

—	Condition.	No.	Sex. M.	Sex. F.	Average age.	Improved	Not improved
						%	%
1	Chronic back strain	30	15	15	36·1	26 (86·7)	4 (13·3)
2	Sacro-iliac strain	25	4	21	35·2	23 (92·0)	2 (8·0)
3	Lumbo-sacral strain	3	1	2	22·3	1 (33·3)	2 (66·7)
4	Spinal arthritis—						
	Secondary sciatica	8	4	4	44·8	4 (50·0)	4 (50·0)
5	Without sciatica	5	4	1	50·6	2 (40·0)	3 (60·0)
6	Neurotic spine	4	0	4	43·3	0 (0)	4 (100)
	Total	75	28	47	37·5	56 (74·7)	19 (25·3)

Manipulation was carried out in every case under an anæsthetic; as a rule nitrous oxide and ether was used, although in a few cases gas alone was given; the better relaxation given by ether is generally desirable. The manipulation consists essentially of forcible flexion of the spine, a rotatory movement of the pelvis first to one side and then to the other (the "osteopath's twist"), and finally forcible hyper-

extension of the whole spinal column. In some cases lateral flexion is added. The purpose of the procedure is to restore the normal range of spinal movements. The patient gets up on the day after manipulation, starts massage and exercises on the second day, and is discharged on the third day. The after-treatment is designed to maintain the mobilisation produced by manipulation, and massage is gradually replaced by exercises which the patient can carry out at home. Table I. shows the total number of cases manipulated, classified in their several groups; those cured or improved are tabulated under the heading "improved," whilst those unchanged or worse are called "not improved."

Influence of Trauma.

In the cases labelled "strain" (Groups 1, 2, and 3) it was possible to obtain a definite history of injury in 38—i.e., 65·5 per cent.; some gave a history of sudden onset without trauma, in some the pain followed operations or childbirth, and in the remainder the cause was probably postural. It is noteworthy that the results of manipulative treatment were better in cases which were definitely traumatic in origin, as shown in Table II.; moreover, the replies from these patients were more enthusiastic.

TABLE II.—*Total Cases giving a Definite History of Trauma (38).*

A—Improved	"Cured"	15	37 (97·4) %
	"Improved"	22	
B—Not improved	"Unchanged"	1	1 (2·6) %
	"Worse"	0	

The one traumatic case not improved was a chronic back strain which was manipulated in July, 1928; the woman did not return for further treatment, but resumed work after three weeks.

The nature of the exciting injury has been ascertained in these 38 cases, and is shown in Table III.

TABLE III.

—	Fall.	Lifting.	Stooping.	Blow.	Football.	Misc.	Total.	
Chronic back strain	6	7	3	4	1	2	23	38
Sacro-iliac strain	8	3	—	1	1	1	14	
Lumbo-sacral strain	1	—	—	—	—	—	1	

In most cases the injury was produced by a sudden unguarded movement; in some it was due to lifting or carrying an unusually heavy weight, and in a few it was occupational.

Value of X Rays.

X rays were taken in the majority of the cases; this is now done as a routine, but in the strain groups it is a negative X ray which confirms the diagnosis. Apart from showing gross arthritis when present, X rays have revealed the existence of anatomical anomalies such as sacralisation of the last lumbar vertebra, articular tropism or spina bifida, but in no case has this appeared to affect the diagnosis. Calcified glands have also been shown in some cases and fracture of a lumbar transverse process in one; this patient had sacro-iliac strain on the same side which was successfully treated by manipulation, the fractured process producing no symptoms.

TABLE IV.—*Chronic Back Strain.*

Total cases—30. (M. 15, F. 15.)				Traumatic cases 23	
A—Improved	"Cured"	13	26 = 86·7 %	10	22 = 95·2 %
	"Improved"	13		12	
B—Not improved	"Unchanged"	4	4 = 13·3 %	1	1 = 4·8 %
	"Worse"	0		0	

Of the four cases classed as "not improved" in Table IV. three have not returned for further treatment. One has been seen recently and now states that she is improving with continued massage and exercises. The term "chronic back strain" is used to denote a lesion in some part of a comparatively wide area, but in most cases it is applied to a strain of the erector spinæ or the ligaments deep to it. The typical history is of a stabbing pain following a sudden movement made in falling or lifting. On examination there is a tender spot over some part of the erector spinæ; the affected muscle is in spasm, and lateral flexion away from that side is painful and limited; X ray is negative. The underlying pathology is probably the tearing of a few muscular or ligamentous fibres, producing a little hæmorrhage and followed by the formation of fibrous tissue which causes pain when it is stretched. Manipulation aims at putting the joints of the spinal column through a full range of movements and breaking down any fibrous adhesions.

A male, aged 39, a general worker in a cemetery, five years previously, whilst digging, felt as if something had snapped in his back. Since then he had had pain in the left side of the back, aching and gripping in character, and he had been unable to work for a year. On examination there was tenderness over the left erector spinæ with spasm and limitation of movement. The back was manipulated in April, 1927; he had massage and exercises for a month and returned to work in two months. Two and a half years later he reported that there had been no return of pain.

It was necessary to repeat the manipulation in four cases in this group and in one a spinal support was given.

TABLE V.—*Sacro-iliac Strain.*

Total cases—25. (M. 4, F. 21.)				Traumatic cases 14	
A—Improved	"Cured"	5	23 = 92·0 %	5	14 = 100 %
	"Improved"	18		9	
B—Not improved	"Unchanged"	2	2 = 8·0 %	0	
	"Worse"	0		0	

Both the cases not improved in Table V. have had arthrodesis of the affected joint (Smith-Petersen operation); in one the pain was relieved on the operated side but recurred on the other side 18 months later, and she is now awaiting arthrodesis of that side. The other was operated on only six weeks ago, and her condition is so far satisfactory. Sacro-iliac strain is regarded as a genuine condition giving a constant characteristic clinical picture. There is usually a history of a sudden unguarded movement, as in a fall, which produces pain localised to one or other sacro-iliac joint; subsequently there is a peculiar sense of insecurity. On examination the most important sign is tenderness localised to the posterior superior iliac spine and just below it; this is elicited by observing the patient wince on deep palpation in this spot and not by asking "does that hurt?" Another constant sign is pain referred to the joint on raising the leg with the knee extended; pain on compression or separation of the iliac crests is sometimes present. There is no sign of gross disease and X ray is negative. The pathological condition is assumed to be due to a strain of the whole sacro-iliac joint; the normal range of movement in this joint is small, and a slight excess of movement produces strain. Tuberculous disease here is not common, and the patient rarely comes before an abscess has formed or positive X ray signs are present. In some cases there may be arthritis of the joint associated with a general spinal arthritis. In manipulation the twisting movement is the most important, and is usually productive of cracking sounds assumed to be due to the tearing of adhesions.

A female, aged 26, a shop assistant, complained of pain in the lower part of the right side of the back for three months; it had come on after carrying a heavy suit case and was worse on going upstairs. On examination there was tenderness localised to the right posterior superior spine on direct pressure, and pain here on flexion of the right thigh with the knee extended. The back was manipulated in November, 1925, and she returned to work in a week; four years later she reported that the treatment had been very successful and that there had been no return of pain.

Statistically, this is the most satisfactory group, but the percentage of complete cures is not so high as in the chronic back strains. It was also necessary to manipulate twice in five cases and three times in four. Cases which do not respond to manipulation can be cured by immobilisation by arthrodesis.

Table VI. does not represent the proportion of cases of lumbo-sacral strain attending the clinic; they are not usually manipulated, as it has been found

TABLE VI.—*Lumbo-sacral Strain.*

	Total cases—3. (M. 1, F. 2.)			Traumatic cases 1.	
A—Improved	"Cured"	0	1 = 33·3 %	0	1 = 100 %
	"Improved"	1		1	
B—Not improved	"Unchanged"	2	2 = 66·7 %	0	0
	"Worse"	0		0	

elsewhere that they are not as a rule permanently improved by manipulation. The characteristic clinical feature is tenderness localised accurately to the lumbo-sacral junction in the mid-line and just to either side of it. There is usually pain on hyperextension, whilst flexion is free, being carried out at the inter-vertebral joints above the lumbo-sacral junction.

A male, aged 15½, an apprentice fitter, had fallen on to his back in the gymnasium two years previously and had since complained of increasing pain over the sacrum. On examination there was tenderness in the mid-line at the lumbo-sacral junction; flexion was free, but hyperextension and lateral flexion were resisted. There was some spasm of each erector spinæ but no deformity of the spine. The back was manipulated on Dec. 5th, 1927, and he had massage and exercises for three months, after which time he was quite well. Pain returned in February, 1929, and was relieved by exercises in one month. It recurred in September, 1929, and was relieved by a further two months' course of exercises.

The recurrence of pain in lumbo-sacral strain after manipulation is also illustrated by one of the cases already included as sacro-iliac strain.

She strained her back whilst shaking a mat, and when examined had a typical left sacro-iliac strain. During the time she was waiting to come in for manipulation she fell downstairs and hurt the lower part of the back, but made no mention of this until a year after manipulation, when she returned. The sacro-iliac pain was entirely cured, but the lumbo-sacral pain had returned three months after manipulation, and on examination she was found to have a typical lumbo-sacral strain. Further mobilisation has now been attempted by stripping the soft parts from the fifth lumbar spine and excising it, a method which has already been successfully employed.

It seems impossible to produce sufficient movement at the lumbo-sacral joint by manipulation to cure the condition. The alternative treatment is to immobilise the joint by means of a spinal support or by spinal fusion, as suggested by Hibbs and Albee. The characteristic hyperextension pain may be due to contact between the fifth lumbar and first sacral spines.

TABLE VII.—*Spinal Arthritis with Secondary Sciatica.*

	Total cases—8. (M. 4, F. 4.)		
A—Improved	"Cured"	2	4 = 50 %
	"Improved"	2	
B—Not improved	"Unchanged"	4	4 = 50 %
	"Worse"	0	

Of the four cases in Table VII. classed as "not improved," three underwent excision of the lateral lumbo-sacral joint and fourth and fifth intervertebral joint on the affected side. Of these one was cured, and two improved. The remaining case, a woman of 48, stated that she was a little improved, but still has pain in the back, which is relieved by daily massage at home. Of the four improved cases, two had saline injections into the sciatic nerve in addition to manipulation; in one there was a recurrence of pain in the opposite leg six months after manipulation, which disappeared after complete dental extraction. Patients in this group usually come complaining of "sciatica." On examination there is tenderness over the sciatic notch and sometimes along the course of the sciatic nerve. All movements of the lumbar spine are limited, and the erector spinæ is in spasm; X ray shows lipping of the vertebral bodies, and in some cases of the articular processes, although to show the latter it is necessary, as Putti has pointed out, to have stereoscopic X rays. Other causes of sciatica having been excluded, and septic foci eradicated, treatment is directed to the spine in the first instance, and full mobilisation appears in some cases to be able to lessen the pressure on the nerve roots which is the cause of the referred sciatic pain. Adjuvant measures in the form of radiant heat, massage, and exercises are also given and, if the pain is not relieved, excision of the lateral articulations above and below the fifth lumbar vertebra with consequent decompression of the emerging nerve holds out good hope of success. Massive saline injections may be of some value. A number of patients in this group have expressed the opinion that the exercises they were taught keep them free from pain.

A male, aged 53, a theatre box-office clerk, caught cold 15 months previously and was laid up for 14 days with right-sided sciatica. This has been painful ever since, and there was an exacerbation five weeks ago on lifting a heavy object; since then he has been off work. On examination maximum pain and tenderness were localised to the right sciatic notch; pain radiated down the course of the sciatic nerve to the external malleolus, and at times was felt along the distribution of the twelfth dorsal. The right erector spinæ was in spasm; lateral flexion to the left was not possible, and flexion was limited. X ray showed lipping of the lumbar vertebral bodies. The back was manipulated on March 30th, 1928; saline was injected into the sciatic nerve on April 16th, and again on April 24th; the back was manipulated again on April 29th, and he continued to have massage and exercises for four weeks, but returned to work in a fortnight. In October, 1929, he reported himself "practically cured," and added "prior to being admitted to hospital I was hardly able to crawl about; when I came out I was as straight as a guardsman . . . I ache fairly frequently on the right side of the ribs near to the spine, but I find by carrying out some of the exercises that I was put through when being massaged I get rid of the pain."

TABLE VIII.—*Spinal Arthritis without Sciatica.*

	Total cases—5. (M. 4, F. 1.)		
A—Improved	"Cured"	0	2 = 40 %
	"Improved"	2	
B—Not improved	"Unchanged"	3	3 = 60 %
	"Worse"	0	

Of the three cases in Table VIII. classed as "not improved" one had scoliosis, and manipulation was only done to obtain the maximum amount of correction before fitting a spinal support, after which he was considerably improved; one had massage and exercises for two weeks only and has been unable to continue through other illness, and one, who lived at a distance, had no after-treatment after leaving hospital and has not since returned; in this case gas alone was used as the anæsthetic for manipulation. Clinically these cases give a history of gradually increasing pain in the back, worse after lying or sitting still for any length of time. The whole spine is stiff, and there may be tenderness and spasm of the erector spinæ. X ray shows arthritic changes.

A male, aged 58, a coach painter, noticed pain in the back for six years, of gradual onset with no history of injury; the pain was felt across the lumbar region and in the right loin. He had been kept off work for a month. On examination the lumbar spine was very stiff, but there were no definite points of tenderness. X ray showed osteo-arthritic lipping of the lumbar vertebral bodies. The back was manipulated on Feb. 2nd, 1928, and he had massage and exercises for a month. After this he still had some pain and was fitted with a spinal support; he returned to work four months later and now only has pain at times.

Mobilisation appears to be the best treatment for this group, provided efficient after-treatment can be given to maintain it. The alternative is to produce relative immobilisation by means of a spinal support.

TABLE IX.—*Neurotic Spine.*

	Total cases—4. (M. 0, F. 4.)		
A—Improved	"Cured"	0	
	"Improved"	0	
B—Not improved	"Unchanged"	3	4 = 100 %
	"Worse"	1	

Pain in the back is only one of the many complaints made by the women comprising this group (Table IX.). They have usually attended many other departments

of the hospital and have had more than one operation. When examined they present a widespread tenderness both on superficial and deep palpation over the whole of the back, but the spine is quite flexible; despite their complaints they are generally well nourished and appear healthy. Manipulation is unlikely to produce improvement and is only justifiable when it appears that there has been a strain which forms the underlying basis of their condition. Massage and exercises are also useless. Vigorous faradic stimulation may be of some help, and the more vigorous it is the better they like it; if allowed, they will continue such treatment for years, and they are always willing to describe at length their various pains and the different types of treatment they have undergone. The one patient in the whole series who said she was worse as a result of manipulation wrote six years later: "the pain in the lower part of my back is incessant. Night and day I get no rest from pain." She was re-examined and appeared a strong, healthy woman; she was doing her house work. She still had diffuse tenderness over the whole of the back, but the spine was quite flexible despite the fact that X ray showed a certain amount of osteo-arthritic lipping of the lumbar vertebral bodies.

I have purposely made no references to the very considerable literature on the subject, as I wished to arrive at an unbiased opinion of the value of manipulation based on my own observations on this series of cases.

Summary and Conclusions.

1. In chronic back strain and sacro-iliac strain manipulation is successful in about 90 per cent. of cases, and where there is evidence of definite exciting trauma success may be anticipated in almost all the cases.

2. Cases of lumbo-sacral strain are not permanently improved by manipulation.

3. Spinal arthritis, with or without secondary sciatica, should be treated in the first place by manipulation and exercises; improvement may be expected in about half the cases.

4. Cases of neurotic spine do not respond to manipulation unless there is an underlying strain.

5. Manipulation of the back should not be confined to cases where there is mechanical displacement, but should be more widely practised with the reservations stated above. It must be followed by efficient after-treatment.

It is with very great pleasure that I acknowledge my thanks to Mr. Blundell Bankart for permission to publish these results, and for his continued help and interest in their compilation.

PROVINCIAL EYE HOSPITALS.—Worcester City and County Eye Hospital last year attended to 3956 patients, an increase of 650; in-patients numbered 203. Seven artificial eyes and 1232 pairs of spectacles were supplied.—The Eye, Ear and Throat Hospital for Shropshire and Wales (Shrewsbury) reports its busiest year. There were 7155 cases (in-patients 1444), an increase of 315. The great majority of the patients—3061—suffered from affections of the eye and errors of refraction; 1640 were treated for nose and throat affections, and 723 from diseases of the ear. In the isolation ward 23 cases of ophthalmia neonatorum were treated.

BIRMINGHAM DENTAL HOSPITAL.—Owing to the decision to synchronise the hospital with the calendar year the annual report covers 15 months. In that period over 15,000 patients were treated, an increase of nearly one-third upon the last comparable period. There were nearly 14,000 anæsthetic cases, which showed an almost identical increase. The filling of teeth, which is done entirely by students under qualified supervision, had also grown materially. The surgical committee states that there is room for more students, and expresses the hope that "fresh and keen spirits, especially from public schools" will be forthcoming. It is added that every care is taken by the university authorities to ensure thoroughness in the training of dental students.

A NOTE ON CERTAIN ASPECTS OF THE EPIDEMIOLOGY AND MORBIDITY OF YAWS.

WITH SPECIAL REFERENCE TO FAT METABOLISM.

BY J. O. SHIRCORE, M.B., CH.B., M.R.C.P. EDIN.,
DIRECTOR OF MEDICAL AND SANITARY SERVICES, TANGANYIKA TERRITORY.

IN considering the epidemiology and morbidity of yaws in Tanganyika Territory it may be convenient if I preface my remarks with a brief account of the geography and population of the Territory, and give a table of the numbers and distribution of the cases treated.

Tanganyika Territory is that portion of Eastern Africa bounded on the north by Kenya and Uganda, the east by the Indian Ocean, the south by Portuguese East Africa and Nyasaland, and on the west by North-West Rhodesia, the Congo, and the territories of Uranda and Urundi. Its total area is about 365,000 square miles, which includes some 20,000 square miles of water. Along the coast lies a plain, varying in width from 10 to 40 miles, behind which the country rises gradually to a plateau constituting the greater part of the hinterland. This plateau falls sharply from a general level of 4000 ft. to the level of the lakes (Tanganyika, 2590 ft.; Nyasa, 1607 ft.), which mark the great Rift Valley extending northwards to Lake Naivasha. The climate varies greatly according to the height above sea-level. Roughly four climatic zones can be distinguished, though even among these there are considerable local variations

Four Climatic Zones.

(1) The warm and rather damp coast region with its adjoining hinterland. Here conditions are tropical, though not unpleasant except just before and during the rainy seasons when the heat is trying and the atmosphere humid. The average temperature is 78°F.

(2) The hot and moderately dry zone between the coast and the central plateau (300–2000 ft.), This zone is characterised by low humidity, less rain, and a temperature rather lower but with greater daily and yearly variations.

(3) The hot and dry zone of the central plateau between 2000 and 4000 ft. The climate of this zone differs greatly in parts, but its prevailing characteristics are low humidity, moderate rainfall, a fairly high mean temperature with great daily and yearly variations, sometimes exceeding 36° F. daily.

(4) The semi-temperate regions around the slopes of Kilimanjaro and Meru, of the Usambara Highlands, the Ufipa Plateau, and the mountainous areas of the south-western area (4000–10,000 ft.). Frosts occur at the higher altitudes, and the nights are cold.

There are two well-defined rainy seasons annually. Generally speaking, the long rains begin in February or March and last for two or three months, while the short rainy season extends from October to November, but the rainfall is low for a tropical country, and droughts are not infrequent. The total native population is estimated at 4,319,000.

Variations in Incidence.

In the medical report of Tanganyika Territory for 1925 brief notes were given of the comparative incidence of yaws in the different parts of the territory, and the statement was made that there was "an irregularly shaped area comprising the plateau highlands of Iringa, Tabora (north of the Ugalla river), and Dodoma, wherein the incidence is low." There are naturally pockets, in other places, where somewhat similar conditions hold. In the remainder of the territory the incidence is high, with similar pockets of lower or higher incidence. Although some have suggested that insects and indirect contact through wearing infected clothes may convey the infection,

yaws is, in fact, almost entirely a direct-contact disease. The annual medical report for 1924, containing a table showing the sex incidence of 13,619 cases, indicates that, where the district population is undisturbed to any extent by emigration and immigration, the sex ratio for practical purposes is equal. The factors that modify the ratio are the movements of large numbers of male labourers, unaccompanied by their wives, who pass through treatment centres en route to the various plantations, and the fact that males are better able than females to undertake long and arduous journeys for the purpose of obtaining treatment. I am, however, strongly of the opinion that in those districts where scabies is common the abrasions caused by scratching offer increased facilities for the spread of infection. Water in many places is scarce during the dry season, and personal uncleanliness also has a good deal to do with infection. In the areas referred to above the incidence, in my belief, varies with the altitude, rainfall, fertility of soil (which depends on the geological formation), the amount and quality of the foodstuffs, the level of the culture of the people, and directly with the distribution of the tsetse-fly.

The outstanding features of the higher altitude plateau, from 3500 ft. upwards, are healthier climate, good rainfall, and freedom from tsetse-fly over vast areas, which allows the breeding of cattle. (This is not to say that all higher altitude areas are free from tsetse-fly.) The population of these areas have therefore an ample and well-balanced diet, including meat, a variety of vegetables and milk and its products; therefore the necessary intrinsic and accessory factors for the development of a robust disease-resisting constitution are supplied. Not only is there a low incidence of yaws in these regions, but advanced tertiary lesions are much less frequently observed. Compare these conditions with the lower altitude areas of poor soil and rainfall, where annual periods of partial famine occur, where little animal protein, less fat, and no milk are available, where large areas are fly-ridden and the population lives from one year's end to another largely on rice or cassava. The same areas coincide closely with the distribution of hookworm, where the health of the population as a whole is below par, a high incidence of yaws exists, and gross tertiary lesions are very prevalent. A point of interest is that when natives of the low-lying areas of high incidence are found in employment in the coastal towns, such lesions as they show do not as a rule progress but stay dormant, a fact which may be attributed to the richer and regular nourishment available, hygienic surroundings, and personal cleanliness.

Table showing the Number of Cases of Yaws Treated over a Period of Four Years in the Various Provinces.

Province.	Area sq. miles.	Population in thousands.	Cases treated during 4 yrs. 1924-27	Altitude.		Tsetse-fly.
				Above 2500.	Below 2500.	
Mukoba	11,000	329	14,545	14,545	—	+ +
Central	38,078	506	25,668	12,046	13,622	+ +
Eastern	26,320	432	82,585	—	82,585	+ + +
Kinga	37,527	341	24,647	1,400	23,247	+
Kigoma	59,816	260	15,700	15,700	—	+ +
Kindi	37,355	418	69,320	—	69,320	+ + + +
Mahenge	39,401	211	18,132	—	18,132	+
Mwanza	27,940	702	10,484	10,484	—	+ +
Northern	36,018	329	18,398	18,398	—	+
Tabora	36,744	530	21,233	21,233	—	+ + +
Tanga	13,319	261	17,413	—	17,413	+
	363,518	4,319	318,125	93,806	224,319	

Effects of Low Diet.

It would appear from the above data that low metetic values, in particular the scarcity of animal protein, and the almost entire absence of fat, milk, calcium, and fat-soluble A, which are intimately associated with calcium metabolism, are the distinctive factors which play an important part in the morbidity and epidemiology of yaws. And when yaws obtains a hold on the human organism and is untreated, one might well speculate whether the late tertiary manifestations, the osteoporotic lesions, may not be a result of the breaking down of calcium reserve, by an interference of *S. pertenue* with fat metabolism and the activity of fat-soluble A, in the circumstances mentioned.

This seems to support the views of Willaman quoted by Berg in his book entitled "Vitamins," (p. 240).

"The various yeasts and micro-organisms are able to synthesise A for their own needs and are therefore independent of supplies from without. Very interesting therefore is the statement of Willaman (if correct) that certain fungi, and notably *Sclerotinia cinerea*, appear to need a supply of A, being otherwise incompetent to form spores. We must assume that, just as in the case of animals (which are all parasitic upon the plant world), the parasitic mode of life of these fungi has led to a degeneration of the parasites in this respect, so that they are no longer competent to satisfy their need for A by independent production, and are compelled to draw upon the stores of the host."

UTILISATION OF IMMUNITY IN TREATMENT OF CANCER.

By J. C. MOTTRAM, M.B. Lond., D.P.H.,
DIRECTOR OF THE RESEARCH DEPARTMENT, RADIUM INSTITUTE, LONDON.

THE subject of cancer immunity has a large literature. Woglom,[1] reviewing the subject in 1929, dealt with 600 papers and used 26,000 words. I cannot do better than quote one of his opening statements; he says "Of these 600 communications a small number are of permanent value, many record unconscious and unnecessary repetitions of previous experiments, and far too large a proportion are ridiculous, for few investigators seem to realise that cancer research is a discipline requiring some apprenticeship and that not everyone with an inoculating needle and a dozen white mice can plunge in and emerge with a discovery." Nevertheless, a short statement is here made in the hope that it may be a help to those contemplating the treatment of cancer patients from the point of view of cancer immunity.

Nothing has been found in cancer immunity analogous to the immunity of bacteriology. Specific antibodies are unknown. Cancer immunity relates entirely to inoculated cancer. There is no evidence, apart from the rare disappearance of spontaneous tumours, that there is any immunity against a spontaneous tumour once it has occurred. Immunity against cancer inoculation can be effected by the inoculation not only of tumour material, but also of normal tissues; practically all tissues are effective. It appears, therefore, that cancer immunity is no more than immunity against a strange tissue, and that inoculated cancer obeys a general law covering the transplantation of tissues from one animal to another, whether normal or cancerous. Just as an animal cannot be immunised against its own cells, so it cannot be immunised against its own cancer. The growth of an inoculated tumour frequently results in immunity, so that after removing the tumour by operation, the animal is found resistant to a second inoculation. Similarly, destroying an inoculated tumour in situ instead of removing it by operation—as, for instance, by X rays or by injecting into it various drugs—frequently leaves the animal resistant at a subsequent inoculation. There is, however, not the smallest reason for anticipating any such resistance in the case of spontaneous tumours similarly treated. It has been claimed that immunity against cancer inoculation can be effected by the inoculation of cancer cells which have had a lethal dose of radiation. Assuming that this is true, there is, however, again

[1] Cancer Review, 1929, iv., 129.

no reason to believe that any benefit will result from treating patients by removing their spontaneous tumours, radiating them in vitro and returning them by inoculation into the patient. Nevertheless, this treatment has been advocated and carried out on patients.

Experimental Results.

It seemed desirable to try this treatment experimentally on tumours produced by tar in mice. A hundred mice were taken, depilated and scarified at the nape of the neck. Tar was applied twice a week down the middle line over a distance of half a centimetre. After two months 45 mice remained alive, the high mortality being due to an epidemic of enteritis. Warts, cutaneous horns, and epitheliomas began to appear after four months. As soon as a cancer was present, accompanied by invasion of the subcutaneous tissues as evidenced by an easily palpable mass of growth beneath the skin, the diseased area was removed by operation and small pieces taken from the base of the growth were inoculated into the right and left flanks. When both these grafts had grown into measurable tumours, one was removed by operation, cut into small pieces, and exposed to a lethal dose of X rays. The exposure to X rays was kindly carried out by Prof. Russ at the Middlesex Hospital. The radiated tumour was finally inoculated into the mouse. The growth of the other graft was then watched to see whether the inoculation of the radiated tumour effected it in any way. Only six mice survived these long and severe experimental procedures. In some cases the grafts did not grow, or grew on one side only; in others the wound became infected, or the primary growth recurred and killed the animal.

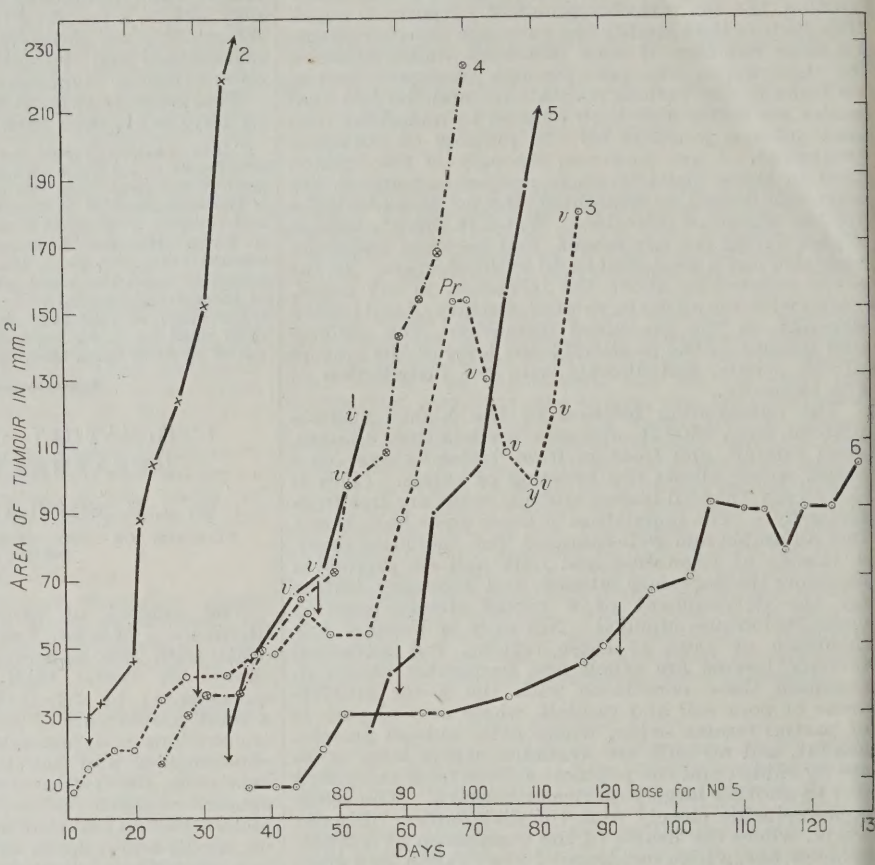
The following table gives the histories of these six mice; the figures represent days.

First operation.—Removal of primary tumour, graft placed on either side.
Second operation.—Removal of a graft radiation and re-inoculation.

—	Tarring stopped.	Operation—		Death.
		First.	Second.	
1	145	150	179	205 K
2	156	171	186	208 K
3	132	195	223	279 K
4	195	205	253	275 K
5	274	309*	398	426
		374†		
6	?	213	310	337

* Graft grew one side only. † Replaced on both sides.

The growth of the graft left behind at the second operation before and after the inoculation of the irradiated tumour constitutes the test; this information is given in the chart, where it is seen that the growth is progressive in the case of animals 1, 2, 4, and 5, and that there is no evidence of any retarding influence as a result of inoculating radiated tumour tissue. In mouse 3 there was a period of regression on the seventieth day, but this was associated with pregnancy, and when the young were born and removed growth at once again became progressive.



The chart shows the growth of the auto-grafts before and after the animals were treated with radiated tumour emulsion. Arrow = radiated tumour inoculated; Pr. = pregnant Y = young born; U = tumour ulcerated.

In mouse 6 the tumour was a slow-growing and variable one, but on the whole growth was not altered by the treatment. In this mouse extensive central necrosis of the tumour was present and accounted for the quick fluctuations in the size of the tumour. It is concluded, therefore, that the treatment had no effect on the growth of the grafts.

Discussion.

Although the experiments are entirely negative it seems desirable to publish them in detail because treatment of patients along these lines has been tried and is being recommended. For reasons given in the introduction, all treatment of patients based on experiments with inoculated cancer are open to the criticism that human conditions are not reproduced in inoculated cancer, but it is possible to carry out experiments with spontaneous tumours in animals, as has been done here, and until this has been done and shown to be effective trials on patients are not justifiable.

The cancer cell does differ from the normal cell of the host, and this very difference enables one to postulate the possibility of cancer immunity set up in an animal against its own tumour, although so far it has not been demonstrated.

Conclusion.

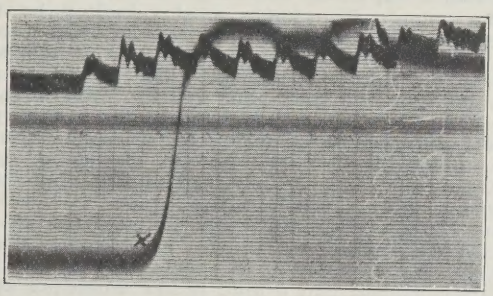
The treatment of mice bearing spontaneous tumours by the inoculation of irradiated tumour has no influence on the growth of these spontaneous tumours. Results obtained with inoculated cancer do not justify the treatment of cancer patients in a similar manner.

Clinical and Laboratory Notes.

A METHOD OF ESTIMATING THE RATE OF FLOW OF BLOOD THROUGH CAPILLARIES.

By I. Harris, M.D. Königsberg,
HON. PHYSICIAN, LIVERPOOL HEART HOSPITAL.

THE determination of rate of blood flow is of great practical importance. In recent times it has been more and more realised that the peripheral circulation plays an important part in heart failure, and stasis and cyanosis largely depend on the rate of flow in the peripheral circulation. As an example of the importance of the rate of flow in practical medicine I will mention the work of Eppinger and his co-workers, who brought forward convincing evidence that cardiac asthma is due to acceleration of blood flow in the peripheral circulation. They also found that morphia slows the circulation and accordingly recommend this drug for cardiac asthma. From my own experience I can testify to the usefulness of morphia in this type of cardiac affection. Obviously the time it takes for the blood stream to traverse the course from the arteries to the veins is the most vital fact in the solution of the majority of the problems of circulation, and it is particularly vital in cases of high



The upper wave is the radial pulse; the lower is the manometer record. × Signifies the time when the venous pressure rises. Time in fifths of a second.

blood pressure. The following method has been employed to estimate the time from the moment the blood stream leaves the arteries to that of reaching the veins.

The armlet of a blood pressure apparatus is placed on the arm. Lower down the basilic vein is connected by means of a needle and tubing to a water manometer. On the wrist the pad of a McKenzie's polygraph is placed on the radial artery and connected by means of rubber tubing to one of the pens of the instrument. The water manometer is also connected by tubing to another pen of the polygraph. The two pens are placed in such a position that their movements can be photographed by means of an apparatus such as is available on the electro cardiograph, to which also a time-marker is attached. Air is now pumped into the armlet, and the pulse completely obliterated. The level of the water manometer connected with the vein will now remain stationary. The pressure in the armlet is suddenly released, but sufficient pressure is left to prevent circulation in the veins of the arm. The pulse-wave which now passes through the radial artery will be automatically recorded on the photographic plate. An appreciable time afterwards the pressure in the water manometer will rise, which will also be recorded automatically on the same plate (see Figure). All that is necessary now is to ascertain the duration of the interval between the appearance of the pulse and the rise of pressure in the water manometer.

A more suitable method which, however, requires special apparatus, is as follows. A drum covered with photographic paper is placed in a box with a slit; the drum is rotated by clockwork. Opposite to the slit is placed the water manometer, a time-marker, and a pen connected by a pad to the radial pulse. Better photographic results are obtained if a cork is allowed to float on the water of the manometer.

It is, of course, necessary to take the ordinary precautions against coagulation.

That this method is reliable is seen from the fact that repeated examinations of the same patient, under similar conditions, give approximately the same results, and that variation of the flow of the blood in the arm, brought about by the application of hot water or ice, gives readings which show an acceleration or slowing respectively of the rate of flow of the blood through the hand.

The same method can be used at the same time for estimation of the cardiac output. The number of beats allowed to pass through the armlet is recorded on the photograph. All that is necessary is to ascertain from the manometer the rise of the water column. It will, of course, be found that the rise in the pressure stands in definite relation to the number of beats permitted to pass through the armlet.

A CASE OF CÆSAREAN HYSTERECTOMY FOR FIBROIDS ASSOCIATED WITH CONGENITAL RECTO-VULVAL FISTULA.*

By A. M. Claye, M.D. Leeds, F.R.C.S. Eng.,
OBSTETRIC SURGEON TO LEEDS MATERNITY HOSPITAL; ASSISTANT SURGEON TO THE HOSPITAL FOR WOMEN, LEEDS.

A PRIMIGRAVIDA, aged 34, first attended the antenatal clinic at the Leeds Maternity Hospital on Oct. 16th, 1929.

There was no previous medical history of note; menstruation had always been regular, 3/28, not excessive. The course of the pregnancy had been normal except for a fortnight's heartburn and sickness immediately prior to booking. She was about 26 weeks pregnant. On inspection of the vulval region there was a pigmented impervious depression at the normal site of the anus, and the lower end of the bowel opened into the vulva just behind the posterior margin of the hymen. Control of the bowels had always been good except when there was diarrhœa; at these times there was occasionally incontinence. On digital examination the opening gripped the finger.

When seen on Feb. 13th, 1930, the patient had been in labour four hours and the membranes were ruptured; there were several fibroids palpable abdominally, the largest being on the left side, about half the size of a cricket ball, and soft. On rectal examination another fibroid of the same size was felt in the pouch of Douglas. The head could not be pressed into the pelvis. I decided to do Cæsarean section.

On laparotomy the two fibroids specifically mentioned were seen, and several smaller ones. That in the pouch of Douglas was adherent to the rectum. The adhesions were separated and after Cæsarean section and delivery of a live male child, weighing 6 lb. 6 oz., subtotal hysterectomy was performed. The patient made an uneventful recovery, and the baby did well.

I can find very few references in the medical literature to recto-anal deformities associated with labour. O. Smiley [1] reported a case of Mother with Imperforate Anus delivered of Normal Child in the United States in 1911. The rectum opened into the vagina 2 inches from the vaginal orifice. The patient was a primigravida of 27; she also had hypospadias. Delivery was effected with the forceps on account of delay. There was retention of urine for 30 hours afterwards, and attempts at catheterisation failed; the condition was relieved by the injection of 2 per cent. boric acid into the bladder, 21 oz. of urine

* Read to the North of England Obstetrical and Gynæcological Society on April 11th.

[1] Jour. Amer. Med. Assoc., 1911, lvii., 2047.

being passed 15 minutes later. The patient developed sepsis, the temperature being raised, with offensive excessive uterine discharge, from the third to the twelfth day; subsequently the condition settled. In 1925 P. R. Cooper [2] reported a case of Labour with Vulval Anus: Prevention of Vulvo-anal Rupture. The anus was in the same situation as in my case—i.e., the common type of congenital fistula was present. The patient was a primigravida of 24. When the head began to appear, it was thought certain that a rupture of the ano-vulval diaphragm would occur unless steps were taken. A right episiotomy was done, which after suture subsequently healed by first intention; the ano-vulval membrane was undamaged. E. C. Brenner [3] in a paper on Congenital Defects of the Anus and Rectum quotes Morgagni as reporting the case of a woman who lived a hundred years, bore several children and never knew of her abnormality. The reference in Morgagni was turned up for me, but no mention of the fact that the woman had borne children could be found.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF MEDICINE.

A MEETING of this Section was held on April 25th, with Dr. R. A. YOUNG, the President, in the chair.

CHRONIC ARTHRITIS TREATED BY GANGLIONECTOMY.

Dr. L. G. ROWNTREE (Rochester, U.S.A.) gave a cinema demonstration of the results of treating chronic arthritis by ganglionectomy. Eighteen such operations had been performed at the Mayo Clinic, he said, on 17 patients. The most encouraging results had been obtained in the chronic cases of arthritis deformans without marked osseous change. He related the case of a young woman who was told by the physicians that she must spend the remainder of her life in bed. She had had arthritis for six years, and was incapacitated, though she was the wage-earner of the family, her mother being an invalid. Dr. Rowntree reasoned that everything done for chronic arthritis had the effect of increasing the circulation and warming the joints; this was true also of treatment for Raynaud's disease. It seemed that such an increase of warmth and circulation was all that was needed to relieve the pain of chronic arthritis. In this case the patient's joints were cold, clammy, and the pain was worse in a storm. Two and a half years after ganglionectomy, however, there was nothing the matter with her legs, and she was walking well. Within six weeks of the operation she was without pain, and had perfect control of her legs, but there was still a good deal of arthritis in the upper extremities, and the pain of this robbed her of sleep. When she tried to raise her arms she had tremor, and there was muscular atrophy of the hands, with much swelling over the knuckles. Therefore the last cervical and the first two dorsal nerves were removed, all the rami being cut. After the operation she was able readily to raise both her hands over her head, and there was no tremor nor pain; there was good movement of the hands, and the atrophy was disappearing.

A girl, aged 16, had cold, clammy feet and painful ankles and knees. She was two months in the wards of the hospital and had previously had eight months of medical treatment elsewhere. Four weeks after ganglionectomy she was trying to walk and there was no more pain. In six weeks she was able to walk without any help; later she was dancing, and returned to school. The legs were still somewhat weak, and there was a little deformity of the spine, which he did not touch.

A woman, aged 44, had a subacute arthritis with fever and anæmia. Six months of ordinary treatment brought no improvement. In May of last year ganglionectomy was done for disability of the upper extremities, and immediately after the operation her fever disappeared and never returned. No further transfusions for her anæmia were carried out after the operation. She asked to be operated upon for the condition in her feet, but this was declined.

A man, aged 26, had osseous arthritis of 12 years' standing. He had a loudly clicking hip with extreme pain. All treatment tried in the course of 12 years failed and five weeks' further treatment in the hospital had no effect. In him the operation achieved nothing except relief of pain in the feet, the main seat of trouble being the hip.

A woman, aged 23, had been ill for 11 years, and had had treatment by autogenous vaccines and otherwise. She screamed whenever she was moved, and very little movement was possible in the legs; radiographic examination under an anæsthetic indicated that her legs were ankylosed, for they could not be flexed. The operation gave her more movement and relieved all the pain in her feet and ankles; the pain in the right hip greatly diminished. In less than three months after the operation she could walk alone, with the aid of a stick. Nine months after the operation she was walking all about the house, with very little pain. Dr. Rowntree thought this patient still had a long way to go, but she could make the journey. Evidently the ankylosis was fibrous, not osseous.

After describing and depicting a number of other cases Dr. Rowntree said that a marked increase in muscle tone and in strength was always noticeable after the operation, along with disappearance of the deformity and the trophic changes. Ganglionectomy was not a panacea; the cases had to be very carefully selected—namely, those with cold, clammy hands and feet, and conspicuous sweating. Results were best in the young. The joints most benefited by the operation were the hands, feet, ankles, and wrists. The improvement in knees and elbows came about more slowly but was definite. The shoulders and hips did not give such good results. Where there was much osseous change the condition did not seem to get much better during the period the patients were under observation. But in the cases most suitable the results deserved the term miraculous. There had been no deaths in this series.

The abdominal approach to the ganglion was of the type described by Hunter and Royle. There had been no difficulty in the operation, except that two patients had had a mild illness, following upon an intestinal disturbance after the operation. Sometimes this took the form of stasis, sometimes diarrhœa. After the initial incision the ganglia were in view in front of the surgeon, and could be removed en bloc without any difficulty. Dr. Adson, who did the operations, hesitated for two years about operating for disability of the arms, for he was not quite certain what should be done. He made, for this, the posterior approach, cutting through the upper ribs and exposing the last cervical and first and second dorsal, and removing them en bloc. The only complication from this was in the case of a woman who had pleurisy for a few days. Though the operation was one of considerable magnitude, and should only be done by neurological surgeons, it should not cause them undue anxiety. Nothing morphologically wrong with the tissues could be detected in these cases and he had seen many ganglia removed in animals apparently without any untoward effect. Nor was there any cardiac insufficiency after the operation.

Some of the above statements were made in answer to questions, and at the end of the demonstration the PRESIDENT commented on the satisfaction which would be felt that something could now be done to help these sorely afflicted people. It was surprising how many parts of the body could be dispensed with.

Prof. W. E. DIXON, F.R.S., and Dr. G. N. MYERS contributed a paper on the

CURATIVE ACTION OF DIGITALIS IN TOXÆMIA.

Prof. DIXON said the work was done to discover whether digitalis was valuable in pneumonia, a matter on which opinion was divided. Some said that if digitalis was used in pneumonia, the patient was more

[2] Clin. Jour., 1925, liv., 155.
[3] Surg., Gyn., and Obst., 1915, xx., 579.

liable to die, while others produced statistics to show that more patients were cured of pneumonia when digitalis was given than when it was not. In nearly every fatal case the death was from toxæmia. Like all microbial infections pneumonia produced a condition of shock, shown by a gradual fall in blood pressure and an enormous dilatation of the splanchnic area; the heart continued to beat normally, and the central nervous system remained active. The shock might, therefore, be due to an action on the central nervous system.

For the experiments diphtheria toxin was ultimately the one selected, on the ground that the dose could be accurately measured; 1/350th of a cubic centimetre killed 95 per cent. of the guinea-pigs which were injected with it. There were two groups of experimental animals; both received the toxin, and one group also had digitalis under certain conditions. Hundreds of tests showed conclusively that if a reliable tincture of digitalis was given to animals they survived subsequent injections of bacterial toxin, even if three times the minimum lethal dose of toxin was given. The same effect was obtained if the toxin was injected first, so long as the use of digitalis was not much delayed. The glucosides from digitalis and strophanthin also showed a life-saving effect, though not to the same extent as that seen after digitalis. The other substance, ouabain, which was used in America as a standard for their digitalis, was a glucoside belonging to the same group, and it was the only one which could be weighed out accurately. It acted as an ideal control because it was valueless in toxæmia, though within a few hours it acted on the heart in the same way as digitalis. Animals which received ouabain died more readily than did those which received the toxin alone. Strophanthus acted quickly on the heart—i.e., it had the action which the physician desired in pneumonia—but if it were given to animals for two days it had no beneficial effect in curing the toxæmia; it must be given for some length of time for this to happen. Given this condition, strophanthus was almost as good as digitalis.

Digitalis had a negligible effect on the leucocytes in normal animals, but digitalised animals showed a decided leucocytosis. It seemed that digitalis, in taking time to act, occupied some portion of the cardiac structure to which the toxin normally attached itself. If digitalis was given to the heart first, the toxin was without effect; but if the toxin was put in first and was allowed plenty of time to act, digitalis afterwards had no effect. Digitalis did not act any more quickly on injection than when given by the mouth. Large doses were required to cause any alteration in the T-wave of the electrocardiogram. This research encouraged the idea that there might be other drugs which might limit or check the activities of pathological organisms in the body. Some hydrologists had recently claimed that the waters of their spas had an antitoxic or detoxicating effect on certain bacterial infections.

MEDICO-LEGAL SOCIETY.

AT a meeting of this Society on April 24th, with Lord RIDDELL, the President, in the chair, a discussion took place on

GONORRHŒA FROM THE MEDICO-LEGAL POINT OF VIEW.

Dr. KNYVETT GORDON, in opening, said his object was to clear up some of the difficulties apt to arise when a case of gonorrhœa emerged from the doctor's consulting room into the solicitor's office or a court of justice. His remarks were based upon the examination of some 7000 specimens from cases of suspected gonorrhœa, and upon experience as a witness in courts.

In the male, when the gonococcus gained entry into the genital organs, the inflammation was accompanied by a discharge, which might be either profuse or so scanty as almost to escape notice. In either case the organism might be confined to a small part of the urethra, or it might get into recesses and glands and lurk there for a long time, its dislodgment being very difficult. The man might then have no discharge, and, under the belief that he was cured, he might marry, and so infect his wife. The female canal had even more recesses and glands than the male, and the organism got into the oviducts, which at their further end opened into the general peritoneal cavity. Thus in women not only was the disease more difficult to cure, but the gonococci were less accessible to the pathologist. If the organism entered the eye, the intense inflammation might lead to blindness; probably half the complete and incurable blindness of babies was caused by contact with the gonococcus in the passages of the mother during birth. One of the complications of the disease was rheumatism and a very definite accompaniment was intense mental depression.

The Social Significance of Gonorrhœa.

It was quite common for an attack of gonorrhœa in the male to be regarded as of little present and almost negligible significance in the future, and as easily curable in any case. This was because after a time the discharge might cease, even when there had been no treatment. Dr. Gordon, however, believed that real cure was even more difficult than in syphilis. For obvious reasons, the fact of having gonorrhœa was often concealed by the patient, so that no doctor was consulted; even if medical treatment was sought, attendance ceased when there was no further discharge, though at this stage a cure might be brought about. In the male the gonococcus might attack the spermatozoa factories, the patient being thus rendered sterile for the rest of his life, even when he had passed the stage of infectivity. The effects on the female were even more serious, for the gonococci sealed up the oviducts so that ova could not reach the uterus. Gonorrhœa was now more common than formerly, because illicit sexual intercourse was no longer synonymous with prostitution, and unmarried women were no longer divided into virgines intactæ and prostitutes. The amateurs were more numerous and more dangerous than professionals—more dangerous because most of them did not know they had the disease. Secrecy of treatment at clinics was relative rather than absolute, especially in country districts. Though from the medical standpoint compulsory notification was easily defensible, he believed that it was impracticable in this country and even if introduced would put a premium on concealment, and thus lead to increased total infection.

Identification of the Organism.

In the male the gonococcus was not difficult to recognise when found, but in the female its discovery was much harder and it had to be differentiated from a number of other organisms which inhabited the genital canal and resembled it. A report on a single swab was valueless for purposes of a decision in court, for an opinion was not proof. The gonococcus was a Gram-negative intracellular diplococcus. In the hands of an expert, Gram's method was entirely reliable, but if carelessly used it might be fallacious. The crucial test of animal inoculation could not be employed, for gonorrhœa could not be communicated to laboratory animals. Two procedures remained: culture and the complement-fixation test. If a positive result was obtained by culture, he believed it was accepted by the court as conclusive evidence of gonorrhœa in the patient, just as it would be accepted by a pathologist. But culture did not always come off, selective media being very sensitive, and a negative result was valueless. The complement-fixation test he regarded as less useful; it gave a positive result in only 40 per cent. of cases of true gonorrhœa, and sometimes a false "positive" was obtained. In addition, it told nothing about the infectivity of the patient. He did not now perform this test.

Infectivity could be determined only by bacteriological tests, and clinical opinion alone should never be accepted.

An important question was whether the finding of the gonococcus was evidence of venereal infection by that disease. In the male one could dogmatically say that if gonococci were found in the urethra, only sexual intercourse could have placed them there, for these organisms were incapable of independent movement. Hence, the infected lavatory must be ruled out as a possible cause, and such an excuse did not prevail with the courts. In the female the case was different. Many women, especially married ones, suffered from a discharge associated with some inflammation of the parts, and both features were indistinguishable from gonorrhœa. Ignorance could scarcely have worse results than where it led to an inaccurate report of gonococcal infection. A case had been heard in the Divorce Court in which the judge ruled that the organisms found were gonococci, though this was against the evidence of bacteriologists; it was also ruled that the woman could only have contracted the disease from her husband, despite the fact that repeated bacteriological tests failed to detect gonococci. On the discovery in young girls of an organism resembling the gonococcus, accusations of rape had been made against innocent men.

A Series of Questions.

There were several questions on which Dr. Gordon sought opinion from legal members. First, seeing how easily the gonococci could get on towels and other articles of common use, was concealment of an attack and neglect to take due precautions an offence? Would it justify dismissal of an employee? The second was, could an unmarried man or woman recover against the other party damages because of alleged contraction of the disease in illicit intercourse? Thirdly, presumably infection of a partner in marriage was a form of cruelty and constituted a ground for legal separation. If the man or woman believed himself or herself to have been cured, what difference did this make in the eyes of the law? If the husband was sterile as a result of an old attack of gonorrhœa, there being no question of infectivity, would this justify a decree of nullity? And in the case of one-child sterility, if a woman forgave infection by her husband before she realised that gonorrhœa had sealed up her tubes, had she a remedy when she learned she could not again bear children? He particularly invited legal contributions on the question of compulsory notification.

Clinical Diagnosis.

Dr. F. J. McCANN agreed that gonorrhœa was not treated by the community generally with the respect its gravity called for. In diagnosis he thought too much reliance was placed on the bacteriologist; his view was that certain cases of the disease could be recognised clinically. If a previously healthy woman suddenly had a discharge, accompanied by local swelling, and pain on micturition, she could be held to be suffering from gonorrhœa, since nothing else caused this group of symptoms. The same was true of a conjoint infection of the cervix, the urethra, and Bartolin's glands; and if tubercle or infection from the bowel could be excluded, double tubal disease meant gonorrhœa in 999 cases out of 1000. The diagnosis of the disease had not yet reached the stage of precision necessary in the witness-box. If one waited too long before taking material for investigation, it was easy for the delicate gonococcus to be overgrown by more vigorous pus organisms. Specimens for this purpose should not be taken from the vagina but from the urethra, and with a sterilised platinum needle. It was very difficult to cultivate the gonococcus. In cases of doubt he thought attention should be paid in court to clinical evidence.

Mr. ERNEST CLARKE remarked that ophthalmia neonatorum was now becoming less in incidence on account of the care now exercised in antenatal clinics, especially when the mother was known to have the disease. He had often wondered what was the legal position when a healthy woman was married to a man who gave her gonorrhœa and thus caused blindness in her child. Could she obtain a separation from her husband for this?

Legal Views.

Mr. W. G. EARENGEY pointed out that to have gonorrhœa was not in itself an offence, and an infected person who was known to have been neglectful and to have communicated the disease to another could not be brought to justice in a criminal court. An employer could do nothing more than give such infected person notice to leave, or, failing such notice, pay him the money due. When a man imparted the disease to the woman he married, the infection was not cruelty unless he did it knowingly, nor was the woman entitled to separation or other remedy; in other words, it was included in the risk or chance she took when she married. If, however, he knew he had the disease before coitus, the infection was legal cruelty. A husband could not sue his wife, nor a wife her husband for a tort. If a man infected an unmarried woman there would be no right of legal action, for the woman would have to rely on something which was against public policy; it would be against public policy for the court to enforce any imaginary right she might have for damages, because the court would have to consider the circumstances in which the disease was communicated. Nor could a married woman take action against her husband for assault because he had infected her. The wife—unless her consent could be shown to have been obtained by fraud—must be held to have given consent to the act. If, however, after a wife had condoned her husband's fault he again lapsed, that cancelled the condonation, and the previous grounds could then be brought forward. Mr. Earengey did not see why compulsory notification should not be made part of the law; and if this were done it would naturally become an offence to impart the disease.

Mr. BARRY O'BRIEN remarked on the importance given in the courts to proof of infidelity on the part of a husband or a wife. If a woman brought an action against her husband in the Divorce Court because he had a gonococcal infection and he said he had never had intercourse with anyone else since marriage, what support was the medical man able to give to his contention that the man's disease must be a latent infection reawakened?

Mr. W. S. JONES said that surely it was possible to give an employee immediate notice if he contracted gonorrhœa. An employer who did not do so was laying himself open to an action for negligence, for other employees might be infected.

Dr. TEMPLE GRAY said a servant could not be dismissed without notice and without wages except for breaking an implied contract; there was no implication that such servant would maintain himself or herself in a certain condition of health. If such a case occurred in his own household, however, he would risk the consequences and would send the servant away forthwith. He asked whether there was any overt sign by which it could be known at about what date the husband had contracted the disease. If a man could not know when it was safe to marry if he had once had the disease, no such man could ever marry with a clear conscience.

Compulsory Notification.

Dr. LETITIA FAIRFIELD said she almost regretted that the opening paper had been read to an audience containing lawyers, for they might assume it was impossible to be certain that any person had ever had gonorrhœa. For a number of years she had been associated with public health work and after the war she had much to do with starting treatment schemes, when there was a good deal of public ignorance about venereal diseases. In a voluntary organisation she had read many thousands of letters which showed very pathetic results of the spread of these diseases. She hoped that juries would not

place too rigid a reliance on the bacteriological tests when a case was before them; the clinical observations should be given an important place. Only very rarely was infection of girls the result of a criminal assault. She did not think the question of compulsory notification was so simple as would appear from some of the remarks. It was not that one hesitated to bring publicity on the sufferer; nor was it in connexion with acute cases that difficulties occurred, for these people were ill and depressed, and even suicidal, and longed for relief. The difficulties were in the class of case in which proof was not at all easy, however it was approached. The Ministry of Health was against the notification of gonorrhœa, feeling that the disease was already difficult enough to get under treatment, and that under notification there would be a great dread, with consequent concealment. In Sweden, where venereal disease was notified, there had been a great diminution in the incidence of syphilis, but it had not affected the incidence of gonorrhœa. The average attendance at clinics was greater in London than anywhere else, and much more good was done by winning the confidence of patients than by trying to hold the disease in check by compulsory methods.

Dr. ERIC DOBSON thought it seemed clear that, irrespective of the patient's or anybody else's feelings, compulsory notification of every venereal disease would be an excellent course. But how would this affect professional secrecy? Also, what action would lie against the notifier for defamation of character or, in the event of subsequent separation or divorce proceedings, for damages? The practitioner was sure to lose his patient, and the latter would let it be freely known in the district that the doctor had got him into trouble through the notification. Dr. Dobson agreed with those who said that compulsory notification would lead to greater concealment than at present. He thought members of the medical profession would shrink from notification, for much the same reason as they were now reluctant to have anything to do with mental cases.

Sir WILLIAM WILLCOX said the question of notification was very difficult, and he did not think it was likely to come into force in this country. The doctor who notified was in an unfortunate position; he was liable to legal action and much expense and anxiety therefrom. "Once notified, always notified"; it would be a life sentence, and the patient would be looked upon as a sort of social leper.

The PRESIDENT said he did not believe Parliament would sanction notification, which would be objectionable from many points of view. Recently the Corporation of Edinburgh had brought in a Bill providing for the compulsory treatment of syphilis, and for such a Bill something could be said. But notification was a different matter.

Reply.

Dr. KNYVETT GORDON reminded Dr. McCann that the gist of his paper was not that the pathologist was the only person who could diagnose gonorrhœa, but that he could not be sure of diagnosing it. He had full sympathy with Dr. Fairfield's remarks. In the material sent him from young girls he found the gonococcus in 80 per cent. He did not agree with the principle that if there were three successive negative reports in a case, it could be regarded as cured. In such cases one could with confidence fall back on the physicians. An expert in the use of the urethroscope would probably be correct in 95 per cent. of cases. Dr. Gordon was personally against compulsory notification of venereal diseases, but it was a duty to impress on the public the seriousness of these maladies. He held that prophylaxis should not only be possible, but should be preached.

A CHILDE OPERATING THEATRE AT PORTSMOUTH.—A third operating theatre, named after the late Mr. J. P. Childe, a former honorary surgeon, has been opened at the Royal Portsmouth Hospital by his widow. It forms the first part of the contemplated extensions.

Reviews and Notices of Books.

OTO-RHINO-LARYNGOLOGY.

Tonsil Surgery. Based on a Study of the Anatomy. By ROBERT H. FOWLER, M.D., Chief Surgeon to the Tonsil Hospital, New York. Philadelphia: F. A. Davis Company. 1930. Pp. 288. $10.

THE first part of this book is largely concerned with the anatomy of the faucial tonsils, and is accompanied by some excellent plates illustrating dissections of the tonsil and the adjacent structures. These anatomical studies are associated with the investigations of Dr. T. Wingate Todd and the dissections of Mr. Harry Beecher; the principal point which emerges from them is that the deep surface of the tonsil is crossed below its centre by a transverse groove into which is inserted fibres of the palato-pharyngeus muscle, called by the author the tonsillo-pharyngeus. This muscular attachment, which has been observed by others and has been variously described as part of the superior constrictor or a "triangular ligament," is, in the opinion of Dr. Fowler, of great importance; he lays great stress on the teaching that these fibres must not be removed with the tonsil in any form of tonsillectomy. A large portion of the book is occupied by full and well-illustrated descriptions of no less than seven methods of tonsillectomy by dissection, some of them differing from others only in small details. Dr. Fowler himself uses a slow, careful, and delicate method, taking great care to remove no muscle-fibres with the tonsil, and he insists on complete rest for five days before operation. The modern guillotine operation is described as being performed in two ways—by dislocating the tonsil either against the angle of the jaw or with the finger; both methods are given as Sluder's, though the former only is properly his. Whillis and Pybus, who first introduced the latter method in this country, are not mentioned. In the discussion of the relative advantages of local and general anæsthesia the conclusion is that the choice depends largely on the training of the surgeon, but that it is better to operate on children under general anæsthesia. No reference is made to diathermy or other methods of treatment, and the book can hardly claim to be a complete treatise on the surgery of the tonsil, for the author does not discuss the treatment of malignant disease nor, except for a brief account of the opening of peritonsillar abscess, any operation except the usual tonsillectomy. A short chapter on evolution quotes largely from the work of Mr. Seccombe Hett and Dr. H. G. Butterfield. The clinical aspect of the subject is dealt with in a rather cursory fashion, and the indications for operation are described too briefly. The results of operation are more fully discussed; the author has found strikingly good results in the treatment of rheumatism both in children and in adults, but does not differentiate between the forms of disease included under rheumatism. The book is beautifully produced and the colour plates are excellent.

Nasal Catarrh. By W. STUART-LOW, F.R.C.S. Eng., Consulting Surgeon to the Central London Throat, Nose, and Ear Hospital. London: H. K. Lewis and Co., Ltd. 1930. Pp. 84. 5s.

THE term "nasal catarrh" includes a multitude of diseases, and the author of this little book has used the title in a popular sense to cover an exposition of his views on a variety of diseases of the nose. He holds strong opinions and expresses them with vigour; indeed, the writing suffers somewhat from over-emphasis. The object of the book is to show that nasal catarrh, whether acute or chronic, originates entirely in obstruction to a free nasal passage, and that the removal of such obstruction is of the most urgent importance in its treatment. Although it is generally acknowledged that obstruction plays a

large part in the causation of chronic catarrh, we hardly think that Mr. Stuart-Low will have succeeded in justifying the use of the word "entirely" in this connexion, or that the dictum should be applied to acute catarrh. Exception must also be taken to the statement that, in all cases of hay-fever, the nasal interior has been ready for the paroxysm, owing to the lining membrane being chronically congested from the presence of some disturbance of its interior anatomy, such as enlargements, deviations, spurs, polypi, or adhesions. The utmost that the author admits is that some patients are especially liable to nasal catarrh when grass-pollen dust is about, but he does not even mention the general specific susceptibility of such patients as shown by their cutaneous reactions. He does not believe in the treatment of nasal catarrh by vaccines, but is "more in favour of the generation of nascently produced antibodies generated at the immediate site of the inflammatory septic trouble by means of galvano-cautery applied to the roots of nasal polypi, granulations, and œdematous sites;" but he adduces no evidence that such treatment does in fact lead to the production of antibodies, and elsewhere he says that "it is reprehensible to apply the galvano-cautery to the middle turbinal region with risk of olfaction being impaired or lost, or fatal meningitis ensuing." On the other hand, Mr. Stuart-Low deserves all credit for his insistence on the importance of conserving the mucous membrane in intra-nasal operations. It is unfortunate that the book contains too many unsupported statements to be given whole-hearted acceptance by the specialty.

CLINICAL ASPECTS OF VENOUS PRESSURE.

By J. A. E. EYSTER, B.Sc., M.D., Professor of Physiology, University of Wisconsin; Associate Physician, Wisconsin General Hospital. London: Macmillan and Co., Ltd. 1929. Pp. 135. 10*s.* 6*d.*

Prof. Eyster's name is associated with numerous researches on cardiovascular subjects. In this volume he considers the application to clinical medicine of physiological observations on venous pressure, and gives a full bibliography of the more important papers on the subject. Venous pressure may be measured directly by the introduction of a cannula into one of the superficial veins; this method is obviously not applicable at the bedside, where repeated observations are required, for, as the writer observes, it is the trend of variation in pressure, rather than the absolute value, which is of importance in prognosis. The indirect method of estimating venous pressure by determining the applied pressure necessary to produce collapse of a superficial vein in the hand or forearm is fully described. This gives results which are quite equal in accuracy to the direct method and can be applied at the bedside without any inconvenience or discomfort to the patient. In health the venous pressure, with the body at rest in the recumbent posture, is maintained in the neighbourhood of from 40 to 60 mm. of water, variations in venous inflow being compensated for by corresponding variations in the ventricular output. When, however, the heart begins to fail and is no longer able to cope with the venous inflow, the venous pressure rises rapidly to 200 mm., or even higher. This rise, according to Prof. Eyster, precedes the other signs of venous congestion, for which indeed it is directly responsible, and is therefore of importance in diagnosis as well as in following the progress of the case under treatment. A series of case-histories is given to illustrate this point. The highest readings (400–500 mm. of water) are recorded in the Valsalva experiment, which is not merely of academic interest, since it is analogous to the straining at stool and other sudden violent physical efforts which may lead to heart failure. By attracting attention to a simple clinical test, which is rarely employed and may be of considerable value, the author of this book has rendered a useful service.

J. GEORGE ADAMI.

A Memoir by MARIE ADAMI. London: Constable and Co. 1930. Pp. 179. 10*s.* 6*d.*

THIS is a brief but replete account of the life of a man of many activities. The book is necessarily uncritical, being compiled and largely written by Prof. Adami's widow, but it nowhere errs on the side of fulsome or indiscriminate praise. The memoir takes us through Adami's successful academic career at Cambridge, and his long experience as professor of pathology at McGill University, notes his brief sojourn in London with high responsibility during the war, and closes with an account of his seven years of active work as vice-chancellor of the University of Liverpool.

Adami knew many members of the medical profession, while every English-speaking pathologist is familiar with his writings, so that this pious memoir will be recalling to many of our readers circumstances which are quite familiar to them. But Prof. Warthin of Michigan points out one thing that may not be generally realised, though it is very true. Adami left a deeper impression, upon the evolution of the philosophy of pathology than he did practically upon its clinical uses and applications. At Montreal he was especially interested, as Sir Humphry Rolleston, an intimate friend, points out in a brief introduction, in bringing his subject into close relation with other branches of science, and this he was specially qualified to do from a long training in scientific biology at Cambridge. And to read a list of his publications, which was steadily added to for over 40 years, is to see how often Adami's views, even if only temporarily useful as supplying working conventions, proved none the less prophetic of the truth.

Mrs. Adami has done well to publish this short history of Adami's activities, and has been fortunate in securing the collaboration of a group of his distinguished friends.

JOURNALS.

LEPROSY REVIEW.[1] Vol. I., No. 2, April, 1930.—H. W. Wade points out that the failure attending isolation in a single colony on the Island of Culion in the Philippines was due partly to inadequate diet with resulting beri-beri, and partly to its being filled early in the century with none but hopelessly afflicted lepers. A new era began in 1921, when the public began to realise that lepers were really being discharged cured. Then, for the first time, early cases began to present themselves voluntarily, and now several hundreds come in annually. H. P. Lie reviews leprosy in Norway, and has constructed an interesting graph showing a progressive decline in its incidence since 1856. Leprosy on the Gold Coast is dealt with by M. B. D. Dixey; in many parts there appears to be an utter indifference to the disease, which is regarded as resulting from some malign supernatural influence. In over 80 per cent of the leper colony the disease is of the anæsthetic type. Treatment consists in injections of alepol, the external application of trichloracetic acid, and the use of potassium iodide. Although the number discharged as bacteriologically negative has proved small, many cases are greatly improved, and the course of the disease is often arrested. M. Wardman and E. Landemann conclude that alepol is superior to sodium gynocardate, and N. Pavloff advocates the use of 5 per cent. solution of chromic acid for ulcerative lesions of the mouth and nose. Tetrodo-toxin, "prepared from the poisonous extract of the globe fish," is said to benefit some cases of leprous neuritis, and I. Kerr reports that the sedimentation test is proving of value in controlling the duration of leprosy treatment.

[1] Published quarterly by the British Empire Leprosy Relief Association, 29, Dorset-square, London, N.W.1. 2*s.*

THE LANCET.

LONDON: SATURDAY, MAY 3, 1930.

THE CRISIS IN HEALTH INSURANCE.

THE report of the Government actuary on the sickness and disablement experience of a group of approved societies, summarised on pp. 981–3, has revealed a disquieting situation. The figures published indicate a steady growth in the number of persons claiming sickness benefit, the increase being most pronounced in the claims of short duration. As a consequence it is probable that the funds of many societies will show a deficit at the quinquennial valuation recently completed; not only may there be no surplus out of which to pay additional benefits but even the present rate of benefits may have to be reduced. Sir KINGSLEY WOOD in the House of Commons on Tuesday emphasised the gravity of the situation, which Mr. GREENWOOD proposed to meet by extending the field of inquiry and submitting the result to the consultative council of approved societies.

What are the causes of this disquieting change in the position of National Health Insurance? That it cannot be attributed to any one factor is certain; to discover its origins the whole field of insurance administration must be reviewed. In the first place the financial framework of the Insurance Act may need reconsideration. Based as it was on the sickness of the Manchester Unity of Oddfellows for the years 1893–97, this experience may not be applicable to such a universal system as the present. The participation of great industrial concerns with a system of administration widely different from that of the old friendly societies may account for some of the deterioration. Through them many wholly bad lives, which would have been refused under former conditions, have been State-insured. Sir ALFRED WATSON assumes that since National Health Insurance was applied compulsorily to those who were in employment on July 15th, 1912, or who entered employment later, the insured population at the outset included no persons who were already disabled; but it is admitted that many bad lives and many cripples were actually included at the outset because, in spite of their disability, they were really in employment of one sort or another. It will be remembered that a special fund, administered by the Post Office, was formed to deal with the cases refused by the approved societies, but so few were in fact refused that deposit contributors were recruited mainly from those who had not troubled to apply to any society for admission. Secondly, it is all too evident that approved societies are not in close enough touch with their membership. There is room for closer co-operation between societies, as well as for improvement in their sick visitation and in their insistence on the rules governing the conduct of members. In the current number of the *National Insurance Gazette* approved societies are urged to "do something themselves." "A person who gets a week's sick pay from an approved society to which he is not entitled needs no sympathy. He needs checking. The best check is punishment." This is the first time we have seen it admitted that approved societies have it in their power to control their members. The societies would do well to turn their attention to the system of payment through the medium of agents. In their anxiety to keep in favour with insured persons these local canvassers interpret the rights of the members in a way that must lead to inordinate demands. Coercive pressure put on insurance practitioners is largely due to the advice of these agents, who leave to the medical practitioner the task of explaining the conditions under which sickness claims can be accepted. The ugly rôle of detecting the malingerer devolves entirely on him.

In determining the growth of sickness claims, by far the largest factor is this attitude of the insured persons, which has undergone a change for the worse in the last few years. It is no exaggeration to say that they are out to get all they can in the way of benefits. The atmosphere has changed and many expect "assistance" in one form or another. Sir ALFRED WATSON shows that there are numbers of insured persons who, finding themselves out of unemployment benefit, apply for sickness benefit, and after running through both of these apply again for full sickness benefit, immediately on completion of the waiting period which must elapse before they are entitled to it. Are these people incapable of work within the meaning of the Act? Interpretation of this phrase is not easy and standards must vary. Many insured persons have a low threshold of health; when in full work they are below par, and in comparison with the healthy some degree of incapacity can always be found. But sickness claims cannot be based on vital statistics, and it would be impossible to restrict sickness benefit to those who have definite diseases. The industrial depression through which the country is passing must have its effect in lowering the vitality of the workers; bad housing and environment contribute their quota. Difficult as the practitioner's duty already is to decide which of his patients are legally entitled to sickness benefit and the necessary certificates, it is made ten times more difficult by the threatening attitude of insured persons whose claims are withstood. When at the request of the approved societies the regulation governing change of doctor was altered, so that insured persons could select another practitioner at once without any consent being required, a powerful weapon was put into the hands of the insured. The practitioner who takes a firm stand finds that he loses the insured person by transfer to another practitioner. The panel practitioner, although primarily a doctor, has become largely responsible for the correct administration of sickness benefit. He is now called upon, as Dr. G. L. MCCULLOCH very ably points out,[1] for a high standard of judicial ability in making decisions. And when his patient leaves him the reason for transfer is more often connected with certification than with treatment. The Government has now stated its intention to reconsider the interval during which the patient can change his panel doctor.

Insurance practitioners have a right to expect more support from approved societies in their difficult task. If the Act is to achieve its object the growth in sickness claims must be thoroughly investigated. The immediate problem is to examine the claims of short duration. The waiting period of three days was intended to provide the necessary delay in certain cases in order to see whether actual incapacity developed. Examination of these cases when the first certificates are given will determine whether a reasonable standard in deciding incapacity is being applied. This is essential, for if the present volume

[1] Brit. Med. Jour., April 26th, Suppl., p. 199.

of sickness benefit continues unabated the proper development of the insurance scheme will be arrested. Insurance practitioners as a body can be trusted to coöperate in applying any remedy which can be found to eliminate the so-called "improper" claims. This will involve the maintenance of an agreed standard in judging of incapacity and the resistance to all and every urge to lower that standard. Each member of the insurance service should be able to count on the loyal backing of his colleagues and on their refusal to take advantage of him by readily accepting a disgruntled insured patient.

SURGICAL DEATHS.

THE human body frequently reacts to the strain of operative procedures in an incalculable way, so that every surgical act partakes of the nature of an experiment, and thus may differ in essentials from the performances of the chemist, engineer, or physicist, where the strengths of materials, their behaviour under stress, and their reaction to combinations of circumstances, may often be accurately estimated beforehand. Deaths are liable to occur after operations where the outlook has appeared favourable, and the reasons for these fatalities are frequently difficult to find. Yet it is literally of vital importance to assign such deaths to the right cause in order as far as possible to prevent reiteration of the tragedy, while it is due to the patient to have the real risk of any proposed operation put before him, and here is a place where the necessary information defaults. What the actual hazard is, taking into consideration a large range of procedures carried out by different operators in many clinics, can scarcely be discovered from surgical literature. Mortality figures of the most expert surgeons for such an operation as prostatectomy are quoted by text-books and sometimes by operators, but both surgeon and author should know well enough that the figures do not represent the true mortality of the operation, as carried out by a surgeon of average ability who perhaps has not a clinic organised for this special branch of work. And, as in this valuable piece of surgical interference, so in many other procedures, the influences alike of individual skill and of proper environment and opportunities must be taken into account.

An article in the current number of the *Bulletin* of the American College of Surgeons, entitled the Accrediting of Surgical Deaths, presents the situation in a clear and striking fashion, while advocating a standard method of estimating the mortality of operations which could be used in many hospitals. An investigation carried out in certain American hospitals revealed the fact that institutions differed very greatly in their classification of deaths after operation; on the one hand in some centres every death after an operation was put to the account of surgical procedure, while, at the other extreme, there were hospitals where no fatality was deemed due to surgery unless some gross accident of technique during the actual operation itself was shown to have occurred. When a patient dies from a pulmonary embolism or cardiac collapse or pneumonia during convalescence, the operating surgeon is inclined to disassociate himself from the occurrence, but can he be exculpated from the position of causal agent when the fatal complications would not have occurred had there been no surgical intervention? Yet such deaths are due not to defects in surgical skill but to gaps in our knowledge. The surgeon, though guiltless of negligence—for he has applied to the problem of the patient's disease what knowledge is available—cannot evade responsibility for the fatal outcome. Nor should the surgeon desire to do so, for any other attitude, while lulling him into complacency, would stifle research as to the causation of these unfortunate results. To gain a true perception of what is the mortality after surgical operations, speaking alike generally or with particular procedures in mind, a decision should be attempted as to what deaths are to be accredited to surgery; and the first step to such a decision will be to obtain some uniformity in the records of different hospitals, when a comparison of reports should give a truer picture of operative risks than we have yet been able to envisage.

Dr. E. L. HUNT, the writer of the paper in the *Bulletin* referred to above, outlines a system by which some such collated information might be made available. The proposed records would comprise a preoperative diagnosis; a preoperative estimation of the surgical risk—including the method of evaluation employed; evidence obtained at operation and post-operative developments; a secondary evaluation of the condition of patient, when the primary appraisement has been proved to be wrong; and autopsy findings. The difficulties of the system are evident, for it would reveal defects in the practice of certain hospitals and indeed of certain operators; these form essentials preliminary to progress and the betterment of results. The final assessments would have to be made by some other persons than the operators. If the system were carried out in a clear, impersonal, and scientific manner, the surgeon should not feel that his personal integrity was assailed, and indeed should welcome such scrutiny of his work; but not all men take up this brave attitude under criticism, and while hasty or incompetent surgery would be revealed at its proper value there would be often room for the argument that haste had been employed in the interests of the patient, and had given rise to the appearance of incompetency. The method is primarily directed to the discovery of defects, for only after technical errors are exposed to the light of day can remedial measures be set in motion. Accepted in the right spirit there might result a general improvement in the standard of work done under the influence of greater surgical wisdom. A perception of operative risks in the hands of the surgeon of average ability would be revealed, whilst the assessment of individual surgical skill would be facilitated. No system ever devised can be without its drawbacks, and this is no exception, for there lurks the possible danger that surgical enterprise and research might suffer a check, when an intensive inspection of results was known to follow operative work. Partial gastrectomy for gastric ulcer, compared with gastro-enterostomy upon its introduction, was accompanied by a high mortality, yet it has proved in the end to be much more effective and scarcely at all more dangerous. Thyroidectomy for Graves's disease has passed through a stage of disheartening mortality to one where the risk is often measurably smaller than that of leaving the unfortunate patient to his fate. In both cases enterprise was ill rewarded at the outset. Will the surgeon whose reputation is assessed by the working of any such scheme be anxious to tread unknown fields? Safeguards would have to be devised to protect the legitimate investigator of new surgical methods. But if this were effectively brought about, it is difficult to see any objection to the institution of such a uniform investigation of deaths following operation as our American colleague suggests.

A NATIONAL MEDICAL SERVICE.

As an appendix to the annual report of the Council for the year 1929–30, the British Medical Association has issued proposals for "A General Medical Service for the Nation," and these were printed in the *British Medical Journal* of April 26th. They are fundamental. The service postulated is complete, and is considered under the heading of prevention and treatment. The professional position of the family doctor, the consultant, and the specialist being analysed, the foundation of any efficient system is declared to be the family doctor; and, accordingly, it is stated as implicit in any sound scheme for a national medical service that every individual in the community must be in a definite relation with a general practitioner. This is the existing position as far as the 15,000,000 of insured persons are in question, and the way in which panel practice can be extended to include dependents is laid down, though it is nowhere, apparently, stated what the exact range of population is for whom the benefits of the scheme are intended; granted that a contributory plan for securing medical service is better for some, is it to be assumed that it is best for all? Where, how, and for whom institutional treatment should be provided forms an important section of the document, and here the rôles of the voluntary and Council hospital—this is the name suggested for the transformed poor-law institution—are defined, and the difficulties in adjusting their common claims upon the assistance of their staffs are mentioned as matters requiring further attention. The creation of "Home Hospitals" is advocated, the institutions, whether separate units or annexes to existing hospitals, being for the use of those persons, not fit subjects for free or practically free treatment, who are still unable to pay the charges of private establishments. In the "Home Hospitals" the coöperation of general practitioners in institutional work would receive full play.

It is of great value to the country that the broad views of the British Medical Association upon the problems of national health should receive popular declaration. Close attention on the part of the Association has interpreted the messages of numerous reports from public bodies, of many schemes for medical benefit on special lines, and of many experiences that institutions of all sorts could relate. And the proposals of the Association, in piecing all this together, have been now submitted to the public as a coherent and inclusive scheme of medical service based on simple concrete principles. More is not attempted, while the fullest criticism of what has been done is implied by the comparison of the scheme to a plan submitted by an architect to a householder, who may decide that the specifications for construction, for extension, or for improvement so nearly meet what is wanted that the money must be found, or, on the other hand, may find the cost too high, and either decline to proceed or suggest modifications of a more modest sort. For the scope of the Association's proposals is enormous, being no less than to ensure that "every kind of service which may be necessary for the prevention and cure of disease and for the promotion of full mental and physical efficiency . . . should be at the disposal of every member of the community." In respect of prevention, the coöperation of the public is insisted upon; the duty of the individual to provide a healthy environment in his home and so to live as to promote the health of himself and family being the first step. The next is the right use of the family doctor, who, by educating the individual and the family in the course of his curative and advisory work in the home and in his consulting room, can confirm his patients in their good conduct. Schools, by the education of the children in matters of health, and the public health authorities and voluntary agencies by the dissemination of information and counsel, should enable the public to appreciate the aims of organised sanitation, and stimulate them to play a helpful part, as occasion arises. The proposals of the Association under the head of prevention are here based upon the reiterated publications of the Ministry of Health and the emphatic essays of Sir GEORGE NEWMAN, but under the head of treatment the proposals have been inspired, it may be guessed, by some apprehension that the bureau may come to be unduly predominant. The claim that every individual should have a call upon a family doctor is a direct warning to the public that only by the observer who is in intimate and domestic touch with the sick can any certainty be obtained as to many of the circumstances of an illness. With the general practitioner becoming yearly, almost daily, better equipped, it seems curious that his position should require so much insisting upon, and yet it has been observed that many of the developments not only in public health but in therapeutics generally have been at the expense of the earning powers of the general practitioner. It will be remembered that last year the Council of the B.M.A. reported on the encroachment upon the sphere of private practice through the activities of local authorities and voluntary agencies, and the proposals of the Association at this place form, again, a recognition that the family doctor must be the foundation of any complete and efficient medical service. His life work is the sub-structure on which all forms of medical service can be built, and it is a proof of the partial nature of the public comprehension of scientific medicine that the general practitioner should find limits being set to his opportunities when he has never been better able to take advantage of them and develop them. That the public should turn to him not only in his personal capacity, but as a medium for obtaining the best advice from consultants and specialists, would seem obvious. Auxiliary forms of diagnosis and treatment should be available for all, but the public can only obtain these with any safety through the agency of the family doctor.

Those who find the proposals of the British Medical Association to be merely voicing oft stated and generally accepted sentiments may be reminded that the scheme of the Association is being laid before the public, and not before doctors only. We make no attempt to give in any sense a full résumé of this important document; it is a notable example of brevity when the range of subjects is regarded for which some 15 pages have been found sufficient, and any attempt at ordered curtailment would eventuate in little but a meaningless index of contents. The propounders of the scheme believe that, if put into operation, it would lead to complete coördination of the whole medical service for the community, while it will be gathered that the central figure in the coördination is the general practitioner. It is shown how he can be brought into relation with every institution and service in his area, could relegate his patients for treatment in accordance with their needs to places whose merits he could evaluate, while he would be in touch with the medical officers for school purposes and with organisations for maternity and child welfare, instead of being not infrequently

without the advantages of such contacts. Further, while hospitals are to take their proper place in general medical organisation, much of the time and money wasted in out-patients departments would be saved through the general practitioner's efforts, while he in his turn, especially through the Home Hospitals, would be able to turn institutional experience to the advantage of his patients and himself. The legislation required for such ends would take the form mainly of amendments to the National Health Insurance Acts, and is of the sort that can be readily justified to voters, but the financial side of the scheme is less promising. This matter is not closely dealt with in the proposals, as it is realised that before they can become practical politics their financial aspects must receive expert attention.

Annotations.

"Ne quid nimis."

IN MEMORY OF HARVEY.

LAST year, during the celebrations by the Royal College of Physicians of London of the tercentenary of the publication of De Motu Cordis, Sir John Rose Bradford published an appeal to the medical profession, intended also for the information of the public, in respect of the condition of the tower of Hempstead Church. William Harvey was buried in this church, and the tower collapsed some 50 years ago and has never been replaced. A strong committee was formed last year having for its object the raising of sufficient money to re-erect the tower of Hempstead Church as a memorial to Harvey. The sum of £5700 is estimated to be necessary for the work projected, of which £1500—and probably a little more—have been received, leaving the balance of £4000 to be obtained through the generosity of subscribers, individual or corporate. The appeal was primarily to the medical profession and has resulted so far in this creditable response, to which the great medical institutions have contributed as well as Caius College, Cambridge, where Harvey received his education, and Merton College, Oxford, where later he was warden. Harvey is among the greatest of Englishmen, and the memorial thus suggested is out of all comparison small when set beside his achievement, for all mankind has benefited to an incalculable degree from work which provided a new and true foundation for physiology. So that the small sum needed to erect a material monument to his fame ought to be forthcoming promptly. Donations should be made payable to the Harvey Memorial Fund and sent to the hon. treasurer, Mr. A. W. Ruggles-Brise, Spain's Hall, Braintree, or to Dr. Arnold Stott, 58, Harley-street, W.1, joint hon. secretary with the vicar of Hempstead.

RADIUM IN THE TREATMENT OF INTRA-OCULAR TUMOURS.

IN the April number of the *British Journal of Ophthalmology* we read of what we take to be the first case of sarcoma of the choroid cured by the insertion of radon seeds. The patient was a man aged 65 with a large typical sarcoma of the choroid, who was first seen at Moorfields by Mr. W. S. Duke-Elder. As the unaffected eye was blind the patient not unnaturally refused to have his only seeing eye excised—hitherto the only treatment found effective in preventing the spread or dissemination of a malignant tumour of the retina or choroid. The case was, therefore, suitable for experimental treatment by radium, and was transferred to the care of Mr. Foster Moore at St. Bartholomew's Hospital for the purpose. At first a radon seed of 1 millicurie strength, filtered through 0·5 mm. of platinum, was introduced through a minute incision in the sclera, and left embedded in the tumour for 14 days, after which it was removed by the same route through which it had entered. No very obvious change in the condition of the eye followed, and about four months later a second seed was inserted, this time of a strength of 5 millicuries, with the same filter as before. Less than three months afterwards it was clear to all observers that the growth was shrinking. Five months later still (February, 1930) Mr. Duke-Elder reported that the mass had shrunk to about one-quarter of its size when he had last seen it a year ago. The residue, he thinks, is merely fibrous tissue. Mr. Foster Moore's comment on the case is that the point of paramount importance is the fear of dissemination. When the growth begins to shrink are we justified in assuming that the danger of dissemination has ceased? It seems unlikely, he says, that actively growing cells will be thrown off from a tumour which has begun to regress. If so, the eye no longer remains a menace to the patient, and he is as much protected against dissemination (no more and no less) as if he had had it removed. If, he goes on, we are prepared to accept this view, it seems reasonable to treat any case of accessible intra-ocular sarcoma by the foregoing means when the growth has not as yet seriously spoiled the eye, and in the rare cases when the growth occurs in an only eye, or the only useful eye, it appears to be the proper treatment.

Mr. Foster Moore has adopted the same treatment for glioma, in the case of a boy of 4 years old, one of whose eyes had already been excised two years previously for the same condition. In this case the strength of the radon seed was 3 millicuries, and it was left in the tumour for ten days. As the date of this insertion was only last November, it is too soon to be certain of a complete cure, but the growth had very largely disappeared when he reported[1] it to the Royal Society of Medicine.

EARLY MORNING IN HOSPITAL.

THE rearrangement of the ward work at the Middlesex Hospital in order to avoid disturbing patients before 7 A.M. has stimulated other authorities to consider whether these adjustments are worth making. The Central Bureau of Hospital Information, established under the auspices of the British Hospitals Association and the Joint Council of the Order of St. John and the British Red Cross Society, has received replies from 63 provincial hospitals to a questionnaire on the subject. The accommodation in these hospitals varies from under 100 to over 1000 in-patients, and the wards contain from 13 to 40 beds; each ward needs a day staff of from 3 to 11 and a night staff which in no hospital exceeds two, supplemented in eight hospitals by "runners" to take urgent messages. The information provided includes also the times at which day and night staffs come on and off duty, at which work commences in the wards, and at which breakfast is served to patients and nurses. The hour at which wards are ready for visiting by the resident medical staff is also stated and the hour of attendance by the honorary medical staff, with the earliest operation hour in routine work. The Bureau also asked each hospital to estimate the additional staff required to avoid disturbance of patients before 7 A.M., and to give an opinion on the wisdom of such a change. An examination of the figures supplied shows that the day nurses mostly come on duty at 7 A.M. and the night nurses go off duty between 8 and 8.30 A.M., overlapping with the day staff in the morning for one hour to an hour and a half. In three hospitals (Nos. 9, 14, and 63) there is no overlapping in the morning. In 45 hospitals work begins in the wards before 6 A.M., and in 18 at 6 A.M. or later. The

[1] Proc. of Roy. Soc. Med., February, 1930, p. 475.

interval between the beginning of work and breakfast varies from 0 to 2½ hours, the majority of hospitals allowing from 30 to 60 minutes. The interval between the beginning of work in a ward and the morning visits of the honorary medical staff varies from 3 to 6½ hours. With regard to the extra staff required for a postponement of morning activities, the various opinions expressed reflect the difficulty involved in estimating the effect on staff whenever a load factor is increased sharply and for a limited period. Some hospitals protest that the present staff might have to be doubled; others confess that the increase would be difficult to estimate; six announce that no additional staff would be required. The comments are interesting. Roughly half the hospitals consulted point out various difficulties and express doubts whether a later time for opening the wards is practicable or even desirable. About one-third of the hospitals praise the scheme and have either adopted it or are considering its adoption. About one-sixth of the hospitals believe that later rousing is unnecessary or inadvisable, some giving no reason and others saying that patients are used to early rising, may be awake and hungry, and are anyhow likely to need attention before 7 A.M. Moreover—and this is the most crucial argument against a change of organisation involving more staff—the patients in wards which close down, say, at 8 P.M. and open at 6 A.M., get the opportunity for ten hours of undisturbed sleep. No information was apparently asked for—at any rate none is given—about the hour when lights are put out in the various hospitals. Hospital No. 33 suggests that so long as patients get the proper amount of sleep the actual hour of waking is not of great importance. Most people will agree with this dictum, with the important reservation that patients recently admitted to hospital or at home after discharge are not likely to get a good night's sleep if the day's routine at hospital is in sharp contrast with that of home life. Few adults habitually go to bed at 8 P.M., and during the first two hours of the hospital night many patients remain restlessly awake, especially in the summer. Probably the best solution for those hospitals whose wards open at 6 A.M. would be one which could be adopted with no alteration except a psychological adjustment and one to which the Daylight Saving Bill has already accustomed us. Assuming that a ward which is now ready for the doctor at 9 A.M. was allowed to remain closed till 10 A.M., the whole hospital routine could be shifted forward by one hour and no one, except perhaps the house surgeons and students, would suffer. The patient's day would be more like his normal one, the nurses' evening off-duty times would extend to a more convenient hour, and the change would cost nothing.

TESTICULAR GRAFTS.

THE controversy about the experiments of Voronoff has been based on very few facts, and it has been hard to get independent and reliable testimony. The results obtained by Dr. E. Schleyer[1] are, therefore, of interest. He has operated on nine patients, eight of whom ranged in age from 49 to 76, the exception being a eunuchoid of 37, who insisted on undergoing the operation against advice, and who did not benefit. In five of the eight Schleyer claims to have produced appreciable rejuvenation lasting for one to two years. The method was Voronoff's own—namely, transplantation of two slips of ape's testicle into the tunica vaginalis on each side. Schleyer never performed a test excision of the graft in any of these cases, but relied on the somewhat crude method of palpation to inform him of its fate. After nine months the slips were no longer palpable, although the effect continued. He does not agree with Voronoff that the grafts become vascularised and incorporated with the testicle of the host. The effect on the host is, he thinks, due to two or three causes. The hormones produced by the graft or set free when it is absorbed stimulate the testicle to a greater hormone production, and he thinks it probable that the protein substances of the graft stimulate the other glands of internal secretion. The operation can be repeated. Success, he thinks, depends upon a correct choice of patient and on early treatment. There seems no reason to doubt that under certain circumstances testicular grafts will mitigate or remove for a time some of the symptoms of age, but it seems to be fairly well established that Voronoff's method is at best only an administration of foreign testicular substance, and not in any sense a transplantation of a living organism.

[1] Münch. med. Woch., April 18th, p. 664.

HIGH PROTEIN DIETS AND RENAL INJURY.

CLINICAL experience has in the past led observers to regard large amounts of muscle protein as distinctly inadvisable for people suffering from renal diseases, and it has been thought that excessive consumption of meat may be capable of actually provoking renal lesions in man. A great many experiments have been done on animals in recent years to determine precisely the histological and functional effects of consuming abnormally high proportions of protein. The results have been conflicting, for, as might be expected, different species of animals respond to such diets in different ways, and varying renal responses follow the giving of different kinds of protein. Controlled experiments with man himself as the test animal have not been frequent. It may be remembered that a little while ago the Arctic explorer Stefansson and his colleague Andersen subjected themselves for a year to an exclusively meat diet, and that this was found to have had no demonstrably injurious effects on their kidneys.[1] It was pointed out at the time that their actual consumption of protein was not especially high, so that the experiment did not settle the question as to the effect on man's kidneys of excessive amounts of meat protein. Prof. Newburgh,[2] who has been engaged for some years in investigating the toxic effects of high protein diets on animals, has recently reported, in conjunction with some of his colleagues, an experiment on similar lines carried out with a man. For six months their subject, a man of 32 apparently in perfect health, lived on a diet containing a daily allowance of 337 g. of protein. The bulk of his food consisted of fresh beefsteak, veal, and beef liver. The meat was supplemented by green vegetables, butter, and citrus fruits. No subjective disturbances of any kind were noted during the six months and the subject's blood pressure remained unaltered throughout the period. Six weeks after the beginning of the test a slight cloud of albumin was noticed in the urine, and the amount steadily increased till at the end of the sixth month 2 to 4 mg. was being excreted each hour. Ten days after the completion of the experiment and the resumption of a normal diet the albumin had completely disappeared. Perhaps of more significance than the slight degree of albuminuria provoked by the diet was the appearance of increasing numbers of casts in the urine. After two months there was an average excretion of about 1000 casts per hour, and at the end of six months the number was approximately doubled. In the early stages of the experiment the casts were hyaline, later more and more of them were of the granular variety, and towards the end cellular casts were met with. They had completely disappeared from the urine ten days after a normal diet had been resumed. The evidence collected in this single experiment certainly lends support to the view that excessive amounts of meat protein can damage the kidneys in man. Whether considerably smaller amounts taken for a much longer time might have a similar effect cannot be presumed without experimental proof; there is certainly at present no convincing evidence

[1] See THE LANCET, 1929, ii., 238.

[2] Newburgh, L. H., Falcon-Lesses, M., and Johnston, M. W.: Amer. Jour. Med. Sci., 1930, clxxix., 305.

in favour of the view that the amount of meat protein ordinarily consumed by the Western races of mankind can itself initiate renal disease.

A NEW PRINCIPLE FOR AIDS TO HEARING.

THE act of hearing is accomplished by the vibration of end-organs in the cochlea induced by sound-waves which penetrate to the internal ear, and our present methods of assisting hearing involve various forms of apparatus designed to increase the energy of these sound-waves and to conduct them to the cochlea through the middle ear or through the cranial bones. In the telephone, and in electric hearing aids, the sound-waves of speech cause vibrations in a microphone; these vibrations produce modulations of an electric current which, in turn, cause identical vibrations in the microphone of the receiver, and thus reconvert the electric current into waves of sound. It has occurred to Prof. S. Jellinek and T. Scheiber, of Vienna, that the perception of hearing might be accomplished by conducting the modulated electric current directly to the cochlea without first reconverting it into sound-waves. In a preliminary communication [1] they say that they are now able to conduct such a current to the ear and by this means to hear and to differentiate speech, music, and other sounds, and that this hearing is unaffected by plugging the auditory canal. They give no description of the apparatus by which their results have been obtained, and a further communication will be awaited with interest, for the method may prove to be valuable if clear perception of sound can be produced by it in a convenient and practical manner.

RICKETS IN EGYPT.

IN European countries it is generally supposed that rickets is a disease of northern climates where sunlight is deficient. Tropical or sub-tropical countries are believed to be happily free from rickets, as witness the statement of one authority that "in Egypt, India, and China, where infants are brought up in the open air, and where they are bathed in daily sunshine from their birth onwards, no errors in food will produce the disease." How far this statement differs from the truth was pointed out by Dr. I. Shawki, in an address to the International Congress of Medicine and Hygiene, which has now been printed.[2] Of 500 children between the ages of six months and two years, who attended the out-patient department of the Kasr-el-Eine Hospital, 45 per cent. showed bony manifestations of rickets and among 100 apparently healthy children, 23 per cent. showed evidence of rickets on radiographic examination. The causes of these high figures, Dr. Shawki pointed out, cannot be those usually assigned to the production of rickets—namely, absence of sunshine and artificial feeding. Egyptian sunshine fails for perhaps a fortnight in the year, and breast-feeding of infants is the rule, not the exception. There is some evidence that the ultra-violet rays are less powerful in flat low-lying countries, but even so they are probably considerably stronger in Egypt than in countries north of the Mediterranean, though dust may absorb a certain amount of the rays. There is, however, another reason, and one which Dr. Shawki did not mention. The fact is that the Egyptian infant is scarcely ever exposed to the sun. If the poorer class Egyptian mother is asked to undress her child she will draw up two or three thick outer garments and show a cotton or wool shirt which is bound down to the baby by a thick binder of some felt-like material, five inches wide and a yard or more in length. This is rolled round and round the child even during the hottest weather. When fully dressed the child is carried over the maternal shoulder wrapped in the folds of her black draperies. If he sees the sun at all he is fortunate, and as to playing in the open air or bathing in sunshine, his mother would consider such a suggestion madness. Dr. Shawki mentioned prolonged lactation as a common cause of rickets in Egypt; a child is usually breast-fed until he is two years old, or a girl for 18 months, as being less important. If it is remembered that the diet of the poor-class Egyptian mother is scanty, and poor in vitamins, and that other food is not considered to be necessary while a child is taking the breast, the ætiology of Egyptian rickets becomes less obscure.

Dr. Shawki made a third suggestion: frequent gastro-intestinal disturbances may interfere with the absorption of calcium and phosphorus and increase the tendency to rickets. Gastro-enteritis from various causes is, of course, extremely prevalent among Egyptian infants, and is responsible for a large proportion of the death-rate.

[1] Wien. Klin. Woch., April 3rd, p. 417.

[2] Congrès Internat. de Méd. Trop. et d'Hyg., Comptes rendus, tome ii.

PRE-SCHOOL CARE.

THE school medical report from Eccles throws some light on the needs of children aged 2–5 years. It is often stated that from a quarter to a third of school entrants are physically so defective as to be scarcely fit to receive education. Last year Dr. J. E. Spence found that the proportion in Eccles was 23 per cent.; of these, avoiding all exaggeration, in one-fifth the state was serious, in the majority being more or less transitory. Squint he does not include among the serious defects, although its preventive treatment is urgent, a fact of which Dr. Spence shows he is fully aware in his report. The point to which we would draw attention here is that a large proportion of the defects are preventable; Dr. Spence holds that nine-tenths of them could be obviated by improved nurture and environment in early childhood. How can healthy conditions of life, training in hygienic habits, medical care and treatment be brought to bear on the pre-school child? In their endeavour to answer this question the borough council of Eccles have merged the child welfare and school medical services so that children not yet of school age are supervised by health visitors, and have all the facilities of the school clinics open to them. To reduce the gap, they have encouraged the admission to school of children from 3 to 5 years, 44 per cent. of whom are now actually in attendance. But more is needed and is evidently desired. The number of younger children making use of the school clinics is as yet far too small, and the majority are still having no systematic medical care or hygienic education. The provision of nursery schools might help, but the experience in Eccles is that parents are for the most part unwilling for the 2–3 year-olds to attend school, and it is estimated that not more than 15 per cent. of them would do so, even if the provision was made. It is more necessary in the poorer and more crowded parts of a town, but on grounds of economical administration Dr. Spence would prefer to have nursery classes in existing schools, given the necessary extensions and alterations of the premises. His own observations may justly lead others to conclude that (1) the care of the pre-school child is worthy of close attention and vigorous action; (2) for the 2–3 year-olds the coöperative activities of health visitors and treatment clinics should be widely utilised; (3) for the 3–5 year-olds admission to the elementary school should be encouraged when home conditions are not good; (4) in the poorer areas, nursery classes should be held in connexion with existing schools, and where practicable nursery schools set up. Two further lines of attack not specifically mentioned in Dr. Spence's report may be suggested. (5) Parents should be advised to keep their children under the regular care of their own doctors; (6) the mothers of the next generation should be taught the principles of healthy upbringing. Ideally no doubt the wide-spread development of nursery schools is the way to deal with the problem.

THE NECESSITY OF A DEFENCE SOCIETY.

AT the annual meeting of the London and Counties Medical Protection Society Sir John Rose Bradford pointed out the absolute necessity for the existence of "protection organisations," and we may draw attention to his words, though their message is so familiar, because, speaking from a long experience, he suggested that the volume of legal work which would have to be undertaken in the interests of medical practitioners was likely to increase in the future. That is to say that, while medical practitioners seem in increasing numbers to insure against the risk of legal actions, those actions are increasing at a similar or even faster rate. From the annual report of the L.C.M.P.S.—which is not happy in its drawn-out title—it can be gathered that the cases dealt with by the Society during the past year have fallen mainly under the heading of charges brought against members of negligence or unskilfulness. Further, the liability to these charges was increased by absence of precaution on the part of the medical practitioner when, as was very generally the case, an accusation of malpraxis followed treatment for fracture. The opportunities for making these charges have multiplied, obviously in proportion to the increased opportunities for useful surgical interference which modern surgery furnishes. The public are fully aware, as is right, that radiology can often give critical information for the guidance of the surgeon in diagnosing a bone injury, and in repeated cases, where accusations of negligence have been made, had the medical practitioner insisted upon the patient having an X ray examination the charge would never have been brought. But where a dissatisfied patient consults a radiologist some time after the injury, while the doctor has not called the radiologist to his assistance at the time of the injury, the defence against a charge of negligence becomes difficult. The fact that the charge is often not a sincere one, but represents only a manœuvre to avoid payment of a legitimate bill, is beside the point—this is a hard thing to prove, as the money may be withheld out of a genuine disappointment with the treatment, while, whatever the patient's mainspring of action may be, the trouble arising will be the same. Hence in all injuries where it is possible that fractures or dislocations, or both, may have occurred, medical practitioners should secure the support of an X ray examination, and should try to persuade patients of the value of the procedure if they are unwilling to incur the expense. These warning words have been written in THE LANCET before, as they no doubt have been included in the annual reports of various defence associations for many years, but the counsel should be repeated, because this professional risk tends to become more common; and every successful claim of this sort—successful generally because the practitioner has not protected himself in advance—stimulates a certain kind of patient to make a charge of negligence as a way of getting out of paying his bill.

PSITTACOSIS AND THE IMPORTATION OF PARROTS.

THE Ministry of Health and the Department of Health for Scotland have issued orders prohibiting the importation into this country of "all birds of the parrot species" after May 19th. This step is taken for the protection of the public against psittacosis, and the regulations will not apply to parrots required for medical or veterinary research or those consigned to the zoological societies or to persons specially authorised. In the House of Commons on April 16th Miss Susan Lawrence stated that "information has been received in the Ministry of Health of 80 cases of illness which commenced during the present year and in which the patients had been associated with sick parrots." Thirteen of these cases proved fatal, and in nine of them psittacosis appeared on the death certificate as the cause of death. In stopping the importation of parrots Great Britain is following the example of most of the other countries in which the disease has appeared. A review of the subject just published by the secretariat of the League of Nations [1] describes the incidence in these countries and goes on to discuss the ætiology at length. Bacteriologists in France, Germany, and the United States have now confirmed the observations which Bedson, Western, and Levy Simpson reported in our issues of Feb. 1st and 15th, and it is generally agreed that the disease is caused by a filtrable virus. But the League of Nations reviewer is loth to abandon previous ideas, and ingeniously reconciles two schools of thought by suggesting that the virus may be a filtrable phase of a typhoid or food-poisoning organism. Indeed he goes so far as to say that it may "be admitted, until proof is furnished to the contrary, that, bacteriologically, psittacosis is caused by a filtrable virus belonging to the salmonelloses group."

HULL AND MUNICIPAL RADIUM.

THE Kingston-upon-Hull Corporation Bill, which is awaiting a third reading, contains a novel clause (42) dealing with radium supply. As the Local Legislation Committee has approved the clause in an amended form Parliament will presumably accept it. For several years, thanks to the activity of a former medical officer of health, the municipality of Hull has been building up a supply of radium which now amounts, it is understood, to 1034 milligrammes. The Corporation could, of course, utilise this valuable possession in the exercise of its poor-law functions, but it desired to make the radium available to the fullest extent. It therefore seized the opportunity arising out of the promotion of a local Bill on more general matters, and asked for special powers to "purchase or hire or enter into any agreement or arrangement for the use of radium, and supply it to any medical practitioner with or without any charge therefor." This new provision was tacked on to a clause of a not unfamiliar type under which the municipality was to be empowered to supply medical practitioners with medicines, appliances, and requisites for the care and surgical treatment of sick persons. The Local Legislation Committee inserted the following proviso to this clause as to the provision of medicine, &c., generally:—

> "Provided that the medicines, appliances, and requisites to be supplied under this section shall include only those in respect of which, when supplied by a duly qualified medical practitioner under the National Health Insurance Act, 1924, payment is made on the basis of the drug tariff for the time being in force in the city."

As to the provision of radium the Committee has converted the proposed subclause into a new clause (42A) more strictly framed. The new clause authorises the Corporation not to deal directly with the purchase, hire, &c., of radium, but to "make reasonable subscriptions or donations to any trustees or other body constituted for the purpose of holding, supplying or administering radium, and, on making any subscription or donation under this section the Corporation may impose such terms and conditions relative to the supply, administering or use of radium as they may think fit." The expenditure in this connexion is not to exceed a penny rate. The amended clause, which the Ministry of Health has presumably approved, seems wide enough for all practical purposes. The working of this bold experiment will be watched with interest.

THE STORY OF A SURGEON.[2]

Sir John Bland-Sutton tells the story of his life—or rather the notes for such a story—with the kindliness, simplicity, and learning which his writings, whether addressed to scientific or more popular

[1] Monthly Epidemiological Report, April 15th, p. 141.

[2] The Story of a Surgeon. By Sir John Bland-Sutton. London: Methuen and Co. 1930. Pp. 204. 12s. 6d.

audiences, have always exhibited. He describes his childhood with considerable detail, records his early interests in natural history, which were hereditary and which throve in a fortunate environment, and in these early chapters he draws upon his memory for multifarious incidents which determined him to become a surgeon and which compelled him to remain a naturalist. Two closely written chapters are devoted to experiences as a prosector at the Zoo, and it is when recording these events that the author explains how often passages in his book must have lain dormant in his mind for years to recur with vividness during the process of writing. It is this spontaneous character of the reminiscences, whether concerned with hospital, official or private life, with strenuous work or holiday excursions, which alike accounts for their fascination and also for the fact that no very accurate time-chart has been kept in the record of the occurrences. Many reminiscences are included of the professional leaders with whom, in the wards of the Middlesex Hospital and elsewhere, the author was brought into contact, and they are all set down with great charity; those who studied medicine round about the late 'seventies will find much to interest them in the references to Sir James Paget, Hulke, Lister, Freeman of Bath, Douglas Powell, Sir William Flower, Greenhow, Lawson Tait, Sir Patrick Manson, and others, and we are glad to see that the work of Thomas Cooke, in the last of the private anatomy schools of London, receives a word of appreciation. Sir John is the most modest of authors, and in supplying an annotated list of his writings he leaves to others all estimate of their value. Few readers would gather from the notes which he makes on "Tumours, Innocent and Malignant," that this book, written nearly forty years ago, and the first in which tumours were classified in any logical manner, proved a revelation to students in the year of its publication, and revolutionised immediately much of the pathological teaching current at the time (1893). Consecutive editions appeared until the author decided to allow the manual to remain in the form in which it was issued in 1922 as evidence of the state of clinical knowledge in regard to tumours at that date. A preamble to the volume, furnished by Mr. Rudyard Kipling, takes the shape of an encouragement to produce the volume couched in mediæval English, and addressed to the "Knight and Chirurgeon in his work and heart of Middlesex."

THE ROSS INSTITUTE.

THE annual report of the Ross Institute for 1929 indicates the directions in which research is being pursued by the staff and by voluntary workers in the several departments. Dr. J. A. Shaw-Mackenzie, Dr. Jackson Clarke, and Dr. Tertius Clarke have worked in the department of tropical hygiene, which is under the direction of Sir William Simpson. In the department of tropical medicine and dermatology Sir Aldo Castellani, the director, has continued his researches on fungi and fungal diseases, and has investigated various types of colitis; Dr. Mackenzie Douglas has worked on the effect of the growth of intestinal bacteria on carbohydrates and allied substances. The report describes in some detail the active anti-malarial work carried out under the auspicies of the Institute and its director-in-chief, Sir Ronald Ross.

The new Malaria Laboratory at the Institute is now complete and well equipped. Two planters' courses have been held there and doctors either from or proceeding to the tropics have used the laboratory to study both the entomological and practical sides of malaria control. The Industrial Anti-Malarial Advisory Committee of the Institute was inaugurated on July 13th, 1929, and the Committee has since met quarterly to consider problems relating to the economic control of the disease in tropical industries, and to promote and assist the anti-malarial work which is being done in different parts of the world. The Committee has members who represent industries in India, Ceylon, Rhodesia, Malaya, Java, Borneo, and Sumatra, and the services of others representing industries in Africa and of British interests in South America are to be enlisted. A Malaria Expedition toured India in 1928-29. Sir Malcolm Watson comments on "the number of invitations extended to the expedition which showed the great interest now taken in the prevention of malaria, and a fuller realisation of the economic loss it causes to India." In some places anti-malarial work was started during the visit of the expedition; in others arrangements were made for further preliminary scientific work. Industrial companies which have already reaped benefits through approaching the problem by the close association of science and practical work are increasingly supporting the Institute.

The Anti-Malaria Co-operative Societies of Bengal were found to be doing valuable work, and satisfactory reports have been received from the iron ore mines belonging to the Tata Iron and Steel Company of the results of anti-malarial work carried out under Mr. Senior-White. Malaria control at Noamundi mine is apparently admirable. The initial efforts made during the last few years in Assam have proved according to this report that the control of malaria on tea estates in Assam is not only possible but also economically practicable.

In Northern Rhodesia, the directors of the Roan Antelope Copper Mines and the Rhodesian Selection Trust, invited the Institute to assist them in improving the sanitation of their copper properties and in eliminating malaria. Two expeditions have been sent out, the first consisting of Sir William Simpson, Dr. A. Dalzell, and Mr. C. R. Harrison. Sir William returned after four months, and submitted a full report on general sanitary measures and housing to the directors in London. Mr. Harrison stayed for six months to make a survey and start the control work, and Dr. Dalzell will remain in Northern Rhodesia on behalf of the Ross Institute, as special scientific officer to the companies, until permanent arrangements have been completed. Sir Malcolm Watson later visited Rhodesia to inspect the anti-malarial work in progress on the mines and to investigate certain aspects of the problem. Much importance is attached by the Institute to propaganda work with regard to malaria. A paper for laymen on the prevention of malaria, first published by Dr. Cuthbert Christy in 1917, has been brought up to date, and is being issued for free distribution to residents in the tropics in a water and insect proof cover. The distribution will be made through the various Chambers of Commerce and Associations connected with tropical industries throughout the Empire and should have useful results.

THE Minister of Health has decided to restore the Chairmanship of the Welsh Board of Health, and has appointed to the post Mr. John Rowland, a member of the Board and Deputy Controller of Insurance. The Board will henceforth consist of Mr. Rowland, Dr. Llewelyn-Williams, and Mr. Howell E. James.

BOSTON CITY HOSPITAL.—A report of this hospital at Boston, Massachusetts, has now been issued for 1928 and shows that the cost per patient per day was a little over 18*s.* while at the convalescent home it was, roughly, 14*s.* 8*d.* At the hospital proper each out-patient visit cost about 2*s.* 3*d.* Over £21,000 was received from paying patients. There were 23,576 in-patients and 291,557 out-patients. During the year an "afternoon medical out-patient clinic" was opened for the benefit of patients "whose problems require more than the average amount of personal attention the patients require from physicians." The clinic is open three afternoons weekly, and the work is undertaken by three physicians, one of them resident, and three or four fourth year medical students. A new residence for "house officers" has been built at a cost exceeding £71,000, containing a swimming pool, two squash rackets courts and lounge, a card room, a reading room, and sun rooms.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LXX.

THE SIGNIFICANCE OF BLOOD GROUPS.

PART I.*

ALTHOUGH the first steps towards the identification of the blood groups were made by Landsteiner so far back as 1900, it is only during the last ten years that medical students have been expected to know something of their nature and constitution. The matter has been immensely complicated by the fact that the existence of certain differences in the blood of human beings, differences which enabled them to be classed into four groups, was discovered and reported independently in Europe by J. Jansky and in America by W. L. Moss. The European observations, which preceded the American ones by two years, were unfortunately reported in a continental journal little read outside the country of its publication, and as chance would have it the two discoverers used different numerals to identify their groups. Moss's terminology holds in this country; that of Jansky has been largely adopted in America and on the continent, and as a consequence it is always uncertain what group is meant when an author refers to Groups I. and IV. In the present article it is proposed to discard the numerical indications of the groups and to use terms indicating their actual constitution, so far as is known. This is made possible by the work of von Dungern and Hirschfeld, who in 1911 showed that the existence of the four blood groups could be explained by the assumption of two different agglutinable factors resident in the red cells and two agglutinins corresponding to them resident in the plasma or serum. The agglutinable factors of the red cells, or as they are now described the agglutinogens, they called A and B, the corresponding agglutinins they designated by the corresponding Greek letters α and β.

Table I. shows the structure of the four groups according to the scheme of von Dungern and Hirschfeld and their correspondence with the numerical designations of Jansky and Moss.

TABLE I.

Agglutinogen.	Agglutinin.	Group.		
			Jansky.	Moss.
A and B.	Neither.	A B.	IV.	I.
A only.	β only.	A.	II.	II.
B only.	α only.	B.	III.	III.
Neither.	α and β.	O.	I.	IV.

The constitution of the blood groups as described by von Dungern and Hirschfeld has been called into question from time to time. Up to two or three years ago attempts were made by various authors to demonstrate that the agglutination phenomena could not possibly be so simple as they appeared, and that actually other agglutinogens in addition to those described as A and B must exist, with corresponding agglutinins. Recent work has made it fairly clear that the apparent exceptions discovered by various workers were due to errors of technique, and it is now generally admitted that the hypothesis of von Dungern and Hirschfeld suffices to explain the known facts.

These workers gave good grounds for believing that the factors A and B act as dominants and are transmitted from parent to offspring according to Mendelian laws. That this is true has since become abundantly evident; its importance is discussed below.

Blood Transfusion.

For some years after the demonstration of their existence the blood groups had no applications in clinical medicine. Their importance first became evident in connexion with the transfusion of blood; to instil the blood of a healthy subject into an anæmic patient appears to be an obviously desirable procedure and has enjoyed a varying vogue for some hundreds of years; it is only within the last half century, however, that surgical technique has made the operation really feasible, and it was not until the years immediately preceding the war that it enjoyed any widespread popularity. At that time blood transfusion was beginning to find its way into clinical medicine, but it was generally recognised that the procedure possessed the drawback that while in many instances the intravenous introduction of blood was beneficial, in other cases the results might be catastrophic. It was further realised that a blood which suited one patient admirably might be far from suitable to another. It was not until the war had made blood transfusion an almost daily occurrence that it was realised that it was only safe to introduce intravenously red cells which were not agglutinated by the serum of the recipient, otherwise the latter would become acutely ill, and perhaps die; if he survived he would develop hæmoglobinuria, become jaundiced, and in a few hours would be found to have lost all the infused blood.

Experience has now served to establish the general rule which must always guide the selection of donors for transfusion that a *compatible blood is one the red cells of which can neither be agglutinated nor lysed by the plasma or serum of the recipient.*

Reference to Table I. will show that given knowledge of their groups it is possible readily to ascertain beforehand whether or not the red cells of any proposed donor are capable of being agglutinated by the serum of any proposed recipient, in other words to determine compatibility. Thus the serum of an A B individual contains no agglutinins and can agglutinate no red cells; such an individual can receive blood from anyone—he is a "universal recipient." The blood of an A individual contains the agglutinin β; he must not receive blood from groups A B or B. Similarly a B individual must not receive blood of constitution A or A B. Individuals of the O blood constitution, since their serum contains both agglutinins α and β can receive blood from none but members of their own group, but may give blood to anyone; they constitute the "universal donors" and are much in request for transfusion services, so much so that possession of the O blood constitution has a distinct financial value, particularly in America.

Determination of Group.

Reference to Table I. will make it clear that to determine the group of any given individual there are required red cells from the subject of the test and known sera of Groups A and B. If on mixing the red cells with the sera agglutination occurs with both the A and B sera the subject belongs to Group A B; if agglutination occurs with the A serum only to Group B; if with the B serum only to Group A; and if with neither to Group O.

Selection of Donors.

Since Group O consists of the so-called "universal donors" it would seem simple enough, given suitable samples of sera of Groups A and B, to discover donors suitable for transfusion purposes. It is not, however, quite so easy as appears, since the agglutinin titre of the serum of different persons varies considerably, and even in the same individual the titre is subject to variations from time to time. Unless the user has long experience of his grouping sera, he can never be sure of their titre, and may without knowing it be using a serum too weak to identify in all cases the corresponding agglutinogen. As a result of the

* Part II. will appear next week.

variations in agglutinin titre he runs the risk of identifying as O a blood really of the constitution A or B, or he may even be led to regard as A or B bloods which are actually of the constitution A B. Thus blood of the constitution A or B may inadvertently be introduced into the circulation of a subject with sufficient α or β agglutinin in the serum to bring about agglutination or lysis of the red cells. The results of such an error are never beneficial and frequently disastrous.

Blood Matching.

There is only one safeguard against accidents of this sort, and that is direct matching of the bloods of the proposed donor and recipient. For this purpose are required a few drops of the serum of the proposed recipient and an emulsion of the red cells of the proposed donor. One drop of each of these is brought together on a slide ; if neither agglutination nor lysis of the red cells occur the bloods are compatible.

In cases of urgency it is justifiable to use blood of a known or supposed donor of Group O without further testing, but where time allows matching should always precede transfusion. Most of the disasters reported in connexion with transfusion have occurred in cases in which compatibility was tested by grouping alone, without direct matching. I know of two cases in which, owing to weakness of agglutinin titre of the sera used, incompatible bloods were infused under the impression that they belonged to Group O. Actually in both cases they belonged to Group A.

There are good grounds for believing that death following incompatible transfusion is often due to blocking of the renal tubules by the hæmoglobin liberated from the lysed red cells. Precipitation of hæmoglobin from solution will only occur in an acid urine ; when selection of donor is by group alone, without direct matching, it is advisable to attempt to render the urine alkaline. When the citrate method is used the infused citrate is usually sufficient to bring this about, but even so it is good practice to give alkalis by mouth ; where citrate is not used this should always be done if there is the slightest possibility of incompatibility.

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Consulting Pathologist, the Royal Hospital, Wolverhampton.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdrs. N. B. de M. Greenstreet and T. N. D'Arcy to be Surg. Comdrs.

Surg. Lt. J. V. Williams to be Surg. Lt.-Comdr.

The following appointments are notified : Surg. Comdr. T. N. D'Arcy to *Calypso ;* Surg. Lt.-Comdr. D. H. Kernohan to *Norfolk.*

ROYAL ARMY MEDICAL CORPS.

Maj. J. H. Fletcher retires, receiving a gratuity, and is granted the rank of Lt.-Col.

ARMY RESERVE OF OFFICERS.

The undermentioned, having attained the age limit of liability to recall, cease to belong to the Res. of Off : Lt.-Cols. J. H. Brunskill and C. R. L. Ronayne.

TERRITORIAL ARMY.

Col. C. R. White, having attained the age limit, retires and retains his rank, with permission to wear the prescribed uniform.

Lt.-Col. (Bt. Col.) O. B. F. Planck, from 48th (S. Midland) Divl. Train, R.A.S.C., to be Col.

Capt. A. A. Watson, having attained the age limit, retires and retains his rank, with permission to wear the prescribed uniform.

Lt. T. Wallace to be Capt.

L. M. J. A. Pilot to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Col. H. Burrows, having attained the age limit, retires and retains his rank, with permission to wear the prescribed uniform.

Maj. A. C. M. Savege from Active List to be Maj.

ROYAL AIR FORCE.

The short service commission of Flying Officer Abraham Henry Barzilay is antedated to Oct. 1st, 1929, and he ceases to be seconded to the Royal Southern Hospital, Liverpool.

INDIAN MEDICAL SERVICE.

Col. W. C. H. Forster to be Maj.-Gen.

Capt. A. V. Lopes to be Maj.

Lt. P. J. Kelly to be Capt.

Special Articles.

GAUGING THE HOOKWORM LOAD OF A COMMUNITY.

BY CLAYTON LANE, M.D.,
LIEUT.-COLONEL, INDIAN MEDICAL SERVICE (RETD.).

IT is customary, before beginning anti-hookworm work in any community, to gauge its hookworm load by egg counts. The underlying assumption is that egg counts form a dependable index of the number of worms present.

A series of observations made by different persons during the last few years, but not necessarily made with that object in view, have thrown considerable light on several factors which influence the worm-egg ratio and are worth considering in some detail. But the ground must be cleared by certain preliminary comments.

First, nearly all egg counts have been made by methods whose individual accuracy is not admitted except by their sponsors or their sponsors' associates. That does not imply that when carried out on a large scale they do not allow of conclusions correct enough for the purpose considered in this paper. Secondly, no anthelmintic can be depended on to expel all worms, so that when using this means of obtaining and counting worms it is necessary to know and to state whether all worms can reasonably be assumed to have been expelled, and if not, what proportion remains. To attribute to a given number of worms an egg output really produced by quite a different number does not further knowledge.

Illness of the Host : Anthelmintics.

Both these extraneous influences on female hookworms may stop or lessen oviposition. An egg count on an obviously sick man, especially one with an intestinal complaint, is not reliable. Oil of chenopodium, for example, may influence oviposition for a fortnight after its administration. Accordingly, no egg counts must be made within that period of treatment if their object is to determine how effectively an anthelmintic has reduced the worm load of a community, nor should they be made during any epidemic.

Size of the Stool.

If two men harbour the same number of hookworms which oviposit at the same rate, but if the food of one man results in 100 g. of fæces daily and of the other in 200 g., the number of ova per gramme of fæces will be twice as great in the first as in the second ; the size of the stool varies with personal and racial habits of feeding. But it varies also with the age, or rather with the size, of the host, for a child's stool is smaller than that of an adult, and there is nothing to suggest that the egg output of the female hookworm is less in one than in the other. Failure, then, to allow for the size of the stool will make inexact any attempt to estimate by egg counts the worm load of a community, and, if in addition the stools counted include those of children, this error will be increased. It may be noted, in passing, that this egg concentration in small stools will make less inaccurate the less accurate diagnostic techniques, so that when these are used merely to find out the number of persons

infected they will show a higher percentage in children than in adults when both carry the same relatively small number of worms. There are, of course, some infections so heavy that no technique can miss them.

Age of the Infecting Worms.

C. A. Herrick,[1] for *Ancylostoma caninum* in dogs and M. P. Sarles[2] for *A. braziliense* in dogs and cats, have shown that the daily output of eggs increases from the date when they first appear until a maximum is reached. That this occurs in man was shown by A. Looss in 1902 and 1903.[3] He examined at intervals about 0·01 c.cm. of fæces in suspension obtained from a man whom he had deliberately infected. Eggs were first found in this quantity of fæces about ten weeks after infection; they then numbered two, and eight weeks later had steadily increased to 31, remaining at about this level for months.

It follows that in those areas in which acquisition of infection is seasonal, the same egg count at different seasons, will be brought about by a different hookworm load; the one will form no constant measure of the other. In some parts of the world subject to hookworm infection, variations in climate make it likely that hookworm infection is acquired at certain seasons only, in other parts that acquisition is seasonally intensified.

Consistency of the Stool.

By his caustic soda method N. F. Stoll[4] counted the eggs in stools of seven persons, four passing formed, two passing mushy, and one passing liquid stools. Each received two treatments with 1·5 c.cm. of oil of chenopodium and the worms were collected by sieving through a wire mesh of 40 to the linear inch. Of only three cases is it reported that there was subsequent examination to determine the fact or extent of residual infection, and even in them the interval between treatment and re-examination is not stated. In the paper in which he reported these cases Stoll writes: "This dilution technique, subjected to continual scrutiny, only fosters the conviction that when properly used it constantly delivers counts even in light infestations correctly." The inference drawn by readers has probably been that this statement includes these post-treatment examinations. It is clear, of course, that, accepting Stoll's own conclusion noted below—namely, that a mushy stool contains 22 eggs for each gramme when a single female is normally ovipositing—there will still be inaccuracy even after examining from the same stool as many as seven specimens of 0·005 g. each, a number of specimens which few, if any, do examine, and a quantity of stool for each specimen which Stoll and Hausheer now advise.

Examinations in light infections have been reported by W. C. Sweet[5] and by P. A. Maplestone and A. K. Mukerji.[6] Sweet used the modification of Stoll's technique advised by Stoll and W. C. Hausheer,[7] and wrote: "In obtaining the average egg count all persons who gave no egg by the Stoll method were included in a zero count although a considerable portion of them showed eggs by the Willis method." Maplestone and Mukerji carried through several series of post-anthelmintic counts; only one need be quoted: "Eight of the 12 cases were negative to Stoll's count, whereas only one did not contain eggs as demonstrated by Lane's method"—that is, by direct centrifugal floatation (D.C.F.). Stoll's post-anthelmintic counts did not, then, really measure the residual infection, which he claimed to be 0, 2, and 6 per cent., even in the three cases in which he reports having attempted it.

R. B. Hill's[8] similar but more exact work may well give a better idea of the real state of affairs. After egg counts Hill gave to 462 persons one treatment by 2 c.cm. (℥ 30) of oil of chenopodium and two others each by 4 g. (grs. 60) of thymol (a far more stringent régime than that used by Stoll), demonstrated the presence of persistent infection by Willis's gravity floatation method, and estimated its extent by Stoll's. Among those who refused to take more than these three treatments the egg counts after them were 33 per cent. of the originals. This matter has unfortunately to be stressed because, non-evidential as they are, it was on these four formed stools (confirmed by two others giving a somewhat higher rate) that Stoll concluded that each female necator produces eggs at the rate of 44 to each gramme of formed fæces, on these two mushy stools that the figure for that consistency was put at 25, and on this single diarrhœic stool that it was taken as 12 for watery motions, a proportion of 4, 2, and 1. The matter did not end there, for it has become almost obligatory for any one the world over, who wishes his investigation to appear serious, to adopt this ratio, and to express the worm load of a community as if all were passing fæces of one consistency, multiplying his individual counts by the appropriate figure. The need to do so does not, of course, emerge from these meagre data.

The conclusions of other persons are interesting. Docherty,[9] using Stoll's egg-counting method in Ceylon, found that the egg-worm ratios he obtained for formed, "soft-formed," and mushy stools were as 52, 48, and 40; if 52 is correct for the first, the last should, of course, have been 26 if Stoll's formula held. Herrick[1] found that in dog's fæces there was no relationship between stool consistency and the egg-worm ratio. The work of Augustine and his colleagues[10] is particularly interesting. Using the Stoll-Hausheer counting method, they agreed that Stoll's relationship of 1 to 2 between the ovum content of mushy and formed stools held for *A. duodenale* in Egypt, but stated that for *Ascaris lumbricoides* in that country it was 1 to 3. That is to say, the same fæcal material of the same consistency habitually diluted one fæcal constituent twice and another three times. This is impossible. Here, too, the suggested ratio cannot be accepted.

Insofar as it is water which, by dilution of solid matter, causes alteration in consistency, I have made the following investigations.*

The stool examined was spread thinly out within a small evaporating dish so that exactly 1 g. (measured to within 0·01 g.) was added to the dish. This was then placed on a boiling water-bath until the fæcal smear was quite hard. The percentage of solid matter remaining after the water was driven off was as follows: liquid stools, 3, 6, 6, 8, 8, 8, 8, 9, 10, 12, 15, average 8·5; mushy stools, 10, 13, 15, 17, 18, 20, 20, 20, 22, 23, average 17·8; formed stools, 18, 20, 22, 23, 26, 32, 32, average 24·7.

One liquid stool may then have five times as much solid matter as another and more than has a mushy stool; one mushy stool may have more than twice as much solid matter as another and more than has a solid one; and one solid stool may have nearly twice as much solid matter as another. The average solid matter of liquid and mushy stools was in this series as 1 to 2, but it seems optimistic to regard this as more than fortuitous; while the average ratio of solid matter in mushy and formed stools was far from being as 2 to 4. Clearly in these cases it is not through any dilution of solid matter by water that the Stoll formula of multiplication can be justified in stools of different consistency. There is, then, strong evidence that stool consistency does not produce variations in the worm-egg ratio sufficiently exact or constant to demand allowance in estimating the worm load of a community. Indeed Herrick found that when he made such allowance in dogs his results became erratic. In our present state of knowledge no such general formula is admissible; if in any locality an observer elects to use one, the responsibility rests with him to show first that it is locally applicable. The wide acceptance on this exiguous foundation of the need to allow for stool

* Part of work, under a grant from the Royal Society, carried out at the Seamen's Hospital Society's Hospital, Royal Albert Dock.

consistence by a definite formula is an illuminating illustration of the weight carried by authority in certain specialties, at least within tropical medicine, and shows how grave is the responsibility of anyone who may wield that authority lightly.

Intensity of Infection.

For *Ancylostoma caninum* in the dog, Sarles [11] found that as infections increased in weight each female worm laid fewer eggs. In one series each female produced 26,800 eggs daily when infection was by 16 of them; when it was by 187 females each laid 4500 eggs daily. With the number of worms increased twelvefold the fertility of each was reduced to a sixth, so that the total egg output was only doubled. It was clear to me that if anything of the kind held for man, no present or past attempt to measure the worm load by egg counts approached accuracy, and with this in mind it occurred to me to analyse the figures in R. B. Hill's tables,[12] the only material, so far as I knew, by which the matter could be tested. This work was executed in Florida in Porto Rico with great care and under close supervision, and was published with a well-based belief that all stools concerned had been obtained.

In a number of adults the total fæcal deposit was collected for either two or three days; by Stoll's egg-counting method the total number of hookworm eggs passed during each day by each person was estimated; each person was treated with 3 c.cm. of carbon tetrachloride and worm counts were made from the fæces passed for the next 48 hours; two gravity floatation (Willis's) examinations were made and the positive cases egg counted as before; whether found infected or not all cases received a second treatment, this time by 3 c.cm. of oil of chenopodium, and worms were again collected. Incidentally, it may be noted that only in 40 per cent. of cases were no worms recovered by the second treatment, so that the full dose of carbon tetrachloride (which dose has killed) left 60 per cent. of persons still infected. Two further examinations by Willis's technique passed 93 persons as disinfested.

From the very full details published regarding these 93 adults it is possible to discover the average egg output of each female necator in different grades of infection. When there were fewer than 300 female worms (average 111) the average daily egg output of each was about 4000, when it was between 300 and 600 (average 444) the egg output was about 2500, while when there were over 600 (average 897) the figure was about 1500. In other words, with the degree of infection increased fourfold the total number of eggs increased two and a half fold, with infection increased eightfold eggs increased only threefold. In the heaviest grade of infection it took eight worms to produce as many eggs as did three in the lightest, while as between medium and heavy grades, doubling the number of worms increased the egg output by 20 per cent. only. Two points are noteworthy: had Hill not published his protocols, his careful valuable work could not have been used to check for man Sarles's investigations on dogs; and, second, his work confirms Sarles's findings that with an increased load of infection each female hookworm lays fewer eggs. The conclusion is that the egg output cannot safely be used as an accurate measure of weight of infection of a community, nor, of course, of the extent to which mass treatment has been effective.

Species of Hookworm.

The work of Stoll and of Hill quoted above was on necator infections. From the inmates of a lunatic asylum in Queensland hookworms were recovered to the extent of 20 per head, 91·1 per cent. being ancylostomes. Sweet [13] re-examined the inmates 18 months later and, using Stoll's counting method and consistency formula, judged that they had become reinfected to the extent of 75 female worms apiece. This he held to be unreasonable. He did not, however, question either the technique or the formula, but concluded that ancylostomes laid five times as many eggs as necators.

W. W. Cort et al.[14] used Stoll's counting method for determining the egg-worm ratio of about 50 cases in a district of China. Stools were computed to average 100 g. This must be compared with 222 g. in the four cases on which Stoll announced that the female necator laid 44 eggs for each gramme of a formed stool, and which gave a daily output by each female of 9668 ova. The average daily total egg output by each female worm in China was 20,000, the ratio of necator to ancylostoma was as 2 to 3, the egg output of each female necator had been put as about 10,000, so that each female ancylostoma was producing 27,000 eggs daily. The paper does not, however, note the anthelmintic used, nor whether there was any attempt to determine that it produced disinfestation, so that the egg-worm ratio rests here too on an unscientific and precarious basis.

In one case of pure infection by each species of parasite Soper [15] found the daily egg output by each female ancylostoma to be about 20,000, and of each female necator to be about 10,000. Treatment was carried to microscopic cure as tested by D.C.F., used, however, without its efficient comminutor and probably not fully reliable; at the same time, for 25 female ancylostomes there were recovered only seven males, a rather unusual ratio. Soper sought confirmation of this 2 to 1 ratio by mincing up the bodies of 50 females of each species and counting their unlaid eggs. They also were present in about that ratio after the worms had been recovered by oil of chenopodium, alone or combined with carbon tetrachloride.

Augustine et al.[10] investigated the egg-worm ratio in Egypt where *A. duodenale* alone is present. Cases were treated with 3 c.cm. of carbon tetrachloride and 1·5 c.cm. of oil of chenopodium. The Stoll-Hausheer technique was used to make counts before and after treatment. More than one count was usually made on each occasion, or, in other words, the amount of stool examined was not invariably more than 0·005 g. The table given in the paper is not easy to understand (the number of cases is cited equally as 74 and 314 and the symbols are not all explained), but it seems that when two fæcal preparations were examined an egg was found in only one of them in 38 per cent. of all cases—that is, one egg in 0·005 g. of fæces. The findings were brought to the basis of formed fæces, the formula for which, as noted above, was held to be different for hookworms and ascaris and so is quite unacceptable. It was concluded that the female ancylostoma lays eggs at the rate of 238 for each gramme of fæces. The size of the fæcal output is unstated, and the paper does not contain the protocols which would enable others to form their own conclusions as to the value of the observations. At least the conclusion is precarious.

Evidence as to the relative ovipositing power of ancylostomes and necators is, then, meagre, but such as there is, together with the relative bulk of the two worms, suggests that it will prove to be about as 2 to 1.

Conclusion.

It has been seen that general health, size of stools, seasonal or continuous acquisition of infection, intensity of individual infection, and the species of worm concerned may all greatly influence the hookworms' egg output and ought all to be taken into account in attempting a true estimate of the worm load of a community; and that the question of consistency of stool on which so much stress is being laid is an uncertain and inadequately measured factor which has been quite unduly emphasised. It follows that egg counts have not hitherto measured dependably the worm load of a community and can only be made to do so with great difficulty. For certain investigations accurate egg counts are essential; they have indeed been in the past, and will be in the future, of the greatest value. But, as usually undertaken with the idea of obtaining the real measure of the worm load of a community, particularly the load before and after mass treatment, it

must be concluded in our present state of knowledge that they are, in spite of their reassuring appearance of accuracy, a waste of time and money.

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THE RISE IN SICKNESS CLAIMS IN THE INSURED POPULATION.

INVESTIGATION BY THE GOVERNMENT ACTUARY.

Sir Alfred Watson, the Government Actuary, has made an examination of the sickness and disablement experience of a group of approved societies in the period 1921–27, and has reported[1] the result to the Minister of Health as chairman of the Joint Committee of National Health Insurance. A previous analysis of the sickness and disablement experience in the years 1921–23 of a representative sample of the whole body of insured persons was made for the Departmental Actuarial Committee set up to advise the Royal Commission, and was published as an appendix to the report of the Commission. The original sample included some 500,000 men and 400,000 women whose experience was followed through three years 1921, 1922, and 1923. On the present occasion it was regarded as adequate to work upon the experience of societies including about 50 per cent. of the membership in the original sample with the added precaution of taking out the experience of the new sample for each of the years 1921, 1922, and 1923 as well as for the subsequent years, so as to show the experience of a particular and representative group of societies for each year from 1921 to 1927. The membership at the last valuation date of the societies in the new sample comprised 219,000 men, 172,000 unmarried women and 64,000 married women. The latter were thus 27 per cent. of the total number of women, a somewhat higher proportion than that found in the insured female population generally, but from the present point of view the difference is immaterial, separate analyses having been made throughout of the respective experiences of the married and the unmarried. Widows are grouped with spinsters under unmarried women.

Upward Movement of the Claims.

The percentage of the actual weeks of sickness and disablement benefits respectively, in each year, to the corresponding provision made for these benefits by the present valuation basis is shown in Table I.

It is explained that this provision is such as to reproduce, in the case of men, the expenditure which would be incurred if the claims were in agreement with the Manchester Unity experience, 1893–97, due allowance being made for the exclusion of the first three days. A small adjustment is made, in accordance with the present basis of valuation, to assign rather less of the claims to sickness benefit and rather more to disablement benefit than the actual Manchester Unity rates would indicate. As the total cost provided for on the new basis is the same as would be incurred on the Manchester Unity standard without any adjustment, while an increased proportion of the claims is assigned to disablement benefit, it follows that the total quantity of incapacity provided for is slightly more than that shown in the Manchester Unity Tables.

In the case of women the basis is the actual experience of the "Selected Societies" in the year 1923 (as obtained in connexion with the work of the Royal Commission) with an addition of 10 per cent.

TABLE I.—*Percentage of Weeks of Sickness to "Expectation."*

Year.	Men.		Women.			
			Unmarried.		Married.	
	S.B.	D.B.	S.B.	D.B.	S.B.	D.B.
1921	76	54	73	60	63	66
1922	89	65	88	67	82	73
1923	86	72	91	77	92	90
1924	97	81	105	86	110	104
1925	98	83	112	99	121	125
1926	108	93	112	111	124	146
1927	107	100	117	119	130	171

S.B and D.B. = sickness and disablement benefit respectively.

From Table I. it will be seen that in respect of each of the three classes of insured persons the claims for both sickness benefit and disablement benefit have been rising continuously during the seven years. Comparing 1927 with 1921 the claims for sickness benefit have risen in the case of men by 41, of unmarried women by 60, and of married women by 106 per cent. For disablement benefit the corresponding increments are 85, 100, and 159 per cent. In the early years of the period the moderation of the claims was, says the Actuary, a factor of substantial importance in the production of valuation surpluses. Since 1926 in the case of men, and 1924 in the case of women, the position in this respect has undergone a serious change.

Their Number and Duration.

Two factors enter into the average rate of sickness or disablement: (1) the proportion of members who make a claim, and (2) the average length of the period over which the claim lasts. If the claims are rising and it is desired to analyse the cause it is obviously necessary to examine each of these factors, as is done in Table II., the figures in which relate to all ages from 16 to 65 combined. It will be seen that the average duration of claims (per claimant) for sickness benefit within the year has not altered greatly in the seven years as respects either men, unmarried women, or

TABLE II.—*Analysis of Claims with Reference to Number and Duration.*

A. = Weeks of claim to each 100 members.
B. = Number of members claiming in each 100.
C. = Average duration of claims within the year (weeks).

Year.	Men.			Unmarried women.			Married women.		
	A.	B.	C.	A.	B.	C.	A.	B.	C.
Sickness Benefit.									
1921	67	14	4·8	73	12	6·1	135	19	7·1
1922	78	18	4·4	89	15	5·8	176	25	7·0
1923	76	17	4·5	92	15	6·0	199	27	7·2
1924	86	20	4·3	106	19	5·7	238	34	6·9
1925	87	21	4·1	113	20	5·5	262	37	7·0
1926	97	20	4·8	114	19	5·9	268	36	7·5
1927	95	23	4·2	120	21	5·6	282	38	7·3
Disablement Benefit.									
1921	38	1·5	25·4	55	1·9	28·7	76	3·3	23·4
1922	46	1·8	25·2	63	2·2	28·0	85	3·6	23·9
1923	52	2·0	26·3	72	2·6	28·2	106	4·5	23·4
1924	59	2·2	26·5	81	2·9	28·1	123	5·4	22·7
1925	61	2·2	27·1	94	3·3	28·3	147	6·9	21·4
1926	68	2·5	27·3	106	3·7	28·9	174	8·1	21·6
1927	73	2·6	27·7	115	3·9	29·1	204	9·2	22·2

[1] National Health Insurance. Cmd. 3548. H.M. Stationery Office. 1930. 4*d*.

married women. The average for men may be put at four and a half weeks, for unmarried women at something under six weeks, and for married women at something more than seven weeks. On the whole the tendency is downwards in the case of men and unmarried women. Among married women it is rather the other way. The significant fact is the growth in the number of claimants. In this respect the years 1921 and 1927 show the two extremes. Taking men, it is seen that, while 14 out of every 100 claimed sickness benefit in 1921, the proportion had grown to 23 in 1927. Among unmarried women the respective proportions were 12 and 21, and among married women 19 and 38. The growth in the intervening years, though not regular, was practically continuous. The position as to disablement benefit is similar, save that the growth is more regular. The average duration of disablement benefit tends to increase among men but not among women. Indeed, the average duration of disablement benefit among married women shows a tendency to diminish, though it may be surmised that this is due rather to the increasing proportion of cases of recurrent claims by women who had previously exhausted their righ tto sickness benefit, and who were accordingly paid at the disablement rate, than to any shortening of the duration of the really protracted claims. The average duration of disablement benefit within the year in 1927 was between six and seven months per claimant in the case of men and unmarried women, and about five months in the case of married women. The significant feature again is the growth in the number of claimants. Among men the claimants for disablement benefit increased from 15 per 1000 members in 1921 to 26 per 1000 in 1927. Among unmarried women the respective figures are 19 and 39, and among married women 33 and 92. The general position as to married women is very striking; in 1927, of every thousand such women 380 drew sickness benefit and 92 disablement benefit. Of the 92, some 42 drew both sickness and disablement benefit. Of every thousand married women therefore, 430 drew either sickness benefit or disablement benefit or both in 1927.

The Effect of Age.

The question arises as to whether the continuous increase in the number of claims, while their average duration remains the same, is general, or whether the element of age is significant in regard to them. Two tables in the report show the number of claimants for sickness and disablement benefit respectively per hundred members in each age-group in the years 1921, 1924, and 1927 (figures being given separately for men, unmarried women, and married women) and the average duration of claim (per claimant) within the year. The growth in the number of claimants for sickness benefit is, then, seen to have prevailed in all age-groups; this applies equally to men, to unmarried women, and to married women. Between 1921 and 1927 the increase is roughly 60 per cent. throughout among men, 75 per cent. among unmarried women, and 100 per cent. among married women. While the experience of the year 1924 occupied an intermediate position it was distinctly closer to that of 1927 than to that of 1921. The position as to claims for disablement benefit is indistinguishable from that of the sickness claims. In both cases there is a universal increase in the numbers claiming.

So far as disablement benefit is concerned it is explained that in the early years of the system a regular increase in the number of the permanently sick was expected and was provided for in the finance of the scheme. Since National Health Insurance was applied compulsorily to those who were in employment on July 15th, 1912, or who entered employment later, the insured population at the outset included no persons who were already disabled; cases of permanent invalidity among the insured would therefore begin at a very small number and would continuously increase until a stable condition was reached, and the insured population had accordingly become normally constituted from this point of view. The period during which the number of permanent invalids would accumulate was actuarially estimated at about ten years, and while the disturbance of industrial conditions set up by the war may perhaps have resulted in its extension, it is improbable that it went on till 1927. In any case this factor, even if it were still operating in that year, would only serve to explain a moderate increase at the higher ages in the number of recipients of disablement benefit; it could not account fully for the increases shown from, say, age 40 onwards. At the younger ages, where the feature is equally marked, this theory of "natural causes" is still less available as an explanation of the increase in the claims for disablement benefit. Among unmarried women aged 25 to 29, 1·7 per cent. drew disablement benefit in 1921 and 3·0 per cent. in 1927. A preponderating number of the group who were of these ages in 1921 had been insured for nine years (having all been aged 16 and upwards in July, 1912), while those who were of the same ages in 1927 had probably been insured on the average for about ten years. It is obviously quite impossible that the addition, on average, of something between one and two years to the period of insurance in which permanent incapacity could have developed would explain an increase which almost doubles the relative number of the recipients of disablement benefit in 1927 as compared with 1921.

The tables show further that while, in regard to men and unmarried women, the average duration of a claim had fallen perceptibly at ages under 45 between 1921 and 1927 the difference at the higher ages was very small, and on the whole represented an increase rather than a decrease. In these circumstances some further analysis seemed desirable. A distribution of the claims to sickness benefit of men in the years 1921 and 1927 was accordingly obtained.

This analysis was limited, by practical considerations, to cases in which sickness benefit arose in the year of record and was subject to the three days' waiting period. It accordingly excluded cases in which sickness was current at the beginning of the year and cases in which a claim arising in the year was linked up with one that ended in the previous year. There was also excluded a very small class in which the claims, while beginning in the year and being subject to the waiting period, ran on beyond 26 weeks. These limitations on the data were not considered likely to diminish such value as the results might have. The analysis was adjusted to eliminate the disturbance due to the fact that the membership of the sample increased fairly substantially in the seven years.

Analysis showed that at the ages under 45 the number of claims of very short duration increased very greatly, the maximum being an increase of 88 per cent. in respect of claims of over two and under three weeks. For claims of longer duration the increase was smaller. After the first four weeks' sickness there is a quite definite drop in the excess of 1927 over 1921, the decrease continuing as the duration advances. At the ages 45 to 54 the greatest amount of excess is still at duration two and under three weeks. A decrease in the excess as duration advances is not pronounced in this section except in claims of a duration of thirteen weeks and upwards. At the highest age-group (56–64) the percentage increase in 1927 over 1921 is irregular and there is no significant trend among durations up to thirteen weeks. After the duration of thirteen weeks there is a definite drop.

General Conclusions.

The chief conclusion drawn by Sir Alfred Watson is that a continuous growth in the number of persons claiming benefit has been experienced, and that the increase is most pronounced, on the whole, in the claims of short duration. With reference to the question whether these features are persisting, he finds that the claims for sickness benefit in 1928, taken over the whole insured population of Great Britain, were about 91 per cent. of the claims of 1927 in the case of men and 94 per cent. in the case of women. On the other hand, the experience of 1929, as indicated by the first 39 weeks, payments of a number of societies covering nearly 50 per cent. of the insured population, shows a serious rise, in the case of both men and women, over the corresponding period of 1928. Disablement benefit shows a further rise of a few points in the case of both sexes in 1928, and a slight increase in 1929 over the level reached in 1928. Taking both benefits together, it must be concluded that the conditions of 1927 have not subsequently been alleviated.

Sir Alfred Watson has confined his report, as far as possible, to a statement of the statistical results of the analysis which he has conducted. The various questions to which the results may give rise are, he adds, matters for administrative deliberation and, doubtless, for consultation with the medical profession and the governing bodies of the approved societies.

Disablement Benefit: Two Special Inquiries.

Certain statistics obtained in the course of the work of the Actuarial Committee which advised the Royal Commission, suggested that inquiry might profitably be made in regard to two points: (*a*) the extent to which insured persons "declared-off" the funds of approved societies soon after benefit was reduced from the sickness rate to the disablement rate; and (*b*) the extent to which such persons subsequently became claimants for either sickness or disablement benefit. Sufficient data to enable these questions to be examined were accordingly obtained and analysed, and the results are given in the following paragraphs.

Question (a).

An examination was made of the cases, numbering 7155, in which recipients of sickness benefit in the year 1927 had passed on to disablement benefit. The cases were almost equally divided between men, unmarried women, and married women, the respective figures being: men 2320, unmarried women 2250, and married women 2585. These figures are in themselves somewhat arresting, considering that the relative proportions in which the three classes enter into the sample experience are: men 49 per cent., unmarried women 37 per cent., and married women 14 per cent. They may be regarded as a corollary to the facts that in 1927 the average duration of sickness claims over a large part of the table was about 50 per cent. higher among unmarried women, and from 50 to upwards of 100 per cent. higher among married women, than it was among men. Of the 7155 persons who entered on disablement benefit during 1927, 3997 "declared-off" within the year; of the remaining 3158 cases 220 died during the year, and 2938 were still drawing benefit on Dec. 31st.

The results show that (1) a high proportion of "recoveries" after entry on disablement benefit is common to both sexes and to all ages, but (2) the proportion is much heavier at the younger ages than at the older, and (3) is specially heavy, at any rate up to the age of 50, among married women. The fact that the "recoveries" do not include the cases in which the recipient came down to the disablement rate late in 1927, and "declared-off" early in 1928 emphasises the conclusion to be drawn from this table.

It remains to be considered for what periods the insured persons who "declared-off" continued to draw benefit after being reduced to the disablement rate. Of all claimants who passed from sickness benefit to disablement benefit in 1927, and ceased to draw benefit before the end of the year, more than one in six went off the funds almost immediately the benefit was reduced to the disablement rate. Within a month of the reduction 50 per cent. had been certified as capable of work, and within eight weeks 70 per cent. had found their working capacity restored.

Question (b).

The Government Actuary states the results of a statistical examination of the "after-history," in regard to claims, of those persons who "declared-off" disablement benefit in the course of the year 1924. The period of examination is limited to the years 1925 and 1926. There were 5063 such cases, of which 630 had again returned to benefit before the end of 1924 and were still on the funds at the end of the year. These 630 cases have not been further investigated; they are part of a group of intermittent claimants, of the existence of which the facts relating to the 4433 cases in which the "declaration-off" was followed by no further claim during the year will afford sufficient evidence. Of the 4433 cases it should be explained that in 3597 cases the insured person had "declared-off" disablement benefit only once in the year. In 836 cases, on the other hand, there had been at least one previous "declaration-off" disablement benefit within the year, followed by a renewed claim to this benefit; it was the termination of this subsequent claim within the year that brought the case within the scope of the present section of the inquiry. There is no great difference between the sexes or between the two classes of women in regard to the point now under investigation. Of 4433 persons who ceased to draw disablement benefit in 1924, 1854, or no more than 42 per cent., did not claim benefit in the next two calendar years. Analysis of the 2579 persons who returned to benefit in 1925 and 1926 after ceasing to draw disablement in 1924, showed that 1218, or approaching 50 per cent. of them, came back on the funds in 1925 and, having been capable of work for less than a year, were again placed on disablement benefit. So far as questions of supervision are concerned cases of this type are, says Sir Alfred Watson, probably not specially significant, but it is doubtful whether the same view should, in general, be taken of cases in which, after drawing disablement benefit, the insured person "declared-off" and subsequently claimed again after an interval not much exceeding the minimum necessary to enable him (or her) to requalify for the full sickness benefit. It would seem probable that such cases represented fully 15 per cent. of all who relinquished disablement benefit in 1924.

THE BELLE VUE SPA, TREFRIW.

OPENING OF THE PUMP ROOMS.

THE therapeutic properties of the water of Trefriw have been known for more than half a century, but like other natural waters it tends to lose these properties on exposure to air, and for that reason its value has probably been under-estimated in the past. At the Belle Vue Spa, which was opened on April 26th by Sir Arbuthnot Lane, the water is collected in an old Roman pyrites mine, where it drips from the rock into funnels which lead into large containers. To prevent contact with the air there is a layer of liquid paraffin on the surface of the collected water; bottles are filled from the containers by means of pipes, care being taken to exclude air bubbles, and a large tank is fed from the containers, in which it is intended to store water for baths. Mr. Carel Hoefftcke, who has played an important part in establishing the new centre, is considering a method for bottling under water, suggested by Dr. Judd Lewis, who has been asked to advise on the best means of preserving the physicial properties of the water during transport. It is believed that with suitable precautions the water can be bottled so that it will preserve its therapeutic value for a long period.

Qualities of the Water.

The water of Trefriw differs from most natural waters in containing iron in the form of ferrous sulphate and not as the carbonate. It also contains silica, which is unusual, and free sulphuric acid, but does not contain ferric salts, copper, nickel, or zinc, and no high proportion of aperient salts or sulphuretted hydrogen. The strength of the Trefriw water varies in different streams, but is such that it is only surpassed by the Matchless well in Alabama; similar springs in Germany, Sweden, Scotland, and the Italian Tirol have a lower concentration of ferrous sulphate in their waters. The Trefriw water is to be standardised at gr. 1 of ferrous sulphate per ℥i, and the dose will be ℥i; taken in larger quantities the water acts as an irritant and may produce symptoms resembling dysentery. The origin of the water is thought to be a lake some three miles away, whence it percolates through the iron-impregnated rock to the old pyrites mine.

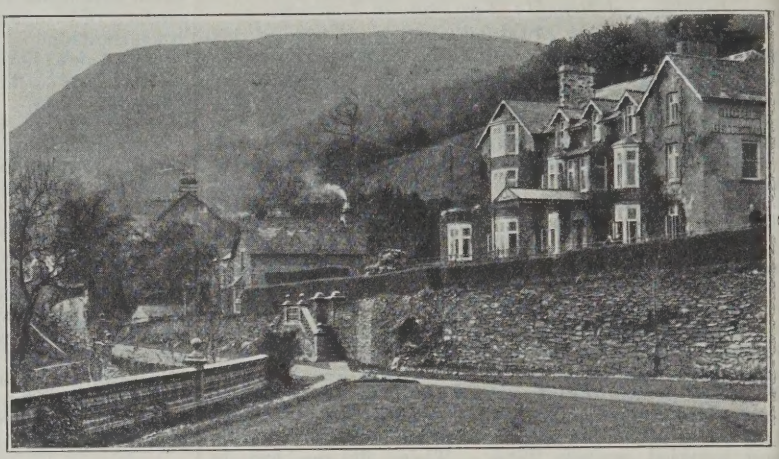
The pump room of the new spa stands on the banks of the river looking towards the famous Trefriw

valley. Like the house in "Peter Ibbetson," it might be called "Parva sed Apta"; at either side of the central pump room are baths and dressing-rooms, and parts of the main room can be curtained off for special treatment. Massage, manipulative and light treatment will be carried on under the supervision of Dr. Williams, who has been in practice near Trefriw for many years. The free sulphuric acid of the water gives it some of the same properties as the acid waters of New Zealand, when used for baths; it has a local irritant action which causes reddening of the skin and increased circulation in the peripheral capillaries.

The Opening Ceremony.

Sir ARBUTHNOT LANE, in his opening address, spoke of his personal debt to the managing director, Mr. Hoefftcke, whose view that inflamed joints should be treated by traction and movement he had on many occasions adopted, with beneficial results to his patients. Trefriw, he said, had once been a famous beauty spot to which visitors came yearly, but for some unaccountable reason its popularity had declined, and with it the prosperity of the inhabitants. It was to be hoped that among its other advantages the new spa would restore the old prosperity to Trefriw. The climate of the valley was particularly suitable for the treatment of rheumatoid arthritis and other joint affections, and this, combined with spa treatment, should help to make Trefriw one of the most important health resorts in Great Britain.

Dr. FORTESCUE FOX said that the interest of scientists was becoming awakened to the value of physical treatment. The water of Trefriw stood at the head of all waters containing ferrous sulphate in Europe, and was only exceeded by the well in Alabama. The value of these waters lay in the highly assimilable form of the iron, a quality which was lost on exposure to air. As usually happened with natural waters, the properties had been discovered by the inhabitants, so that a local tradition became attached to the place. In France the discovery of a natural spring of this type would lead to investigation by the Commission des Eaux Minérales, and the official establishment of a health resort. No such advantages were to be had in England; he would like to see all British natural waters developed under official auspices. As early as 1757 Dr. John Rutty, of Dublin, had published a book ("A Methodical Synopsis of Mineral Waters") deploring the spread of German spa waters with consequent decrease in the use of English and Irish waters. In describing the properties of natural waters he had observed that the native qualities of some were only obtained at the fountain, that those who took the waters should not also take tea, that a milk diet appeared to be helpful during a course of treatment, and that persons who felt the cold could take the waters warm in bed in the mornings with advantage. He had gone on to say that these natural waters, though they seemed to be but weak tinctures of iron, had subtle qualities which gave them more power than artificially prepared waters. These observations of Dr. Rutty were as sound to-day as they had been in the eighteenth century. The therapeutic value of natural waters rested on a valid basis, not on account of their chemical composition, but on account of the energy they introduced, and their power of assisting the elimination of waste products. When the waters left the fountain they underwent changes not in chemical but in physical composition. To have their full value they should be under chemical study and supervision, such as Dr. Judd Lewis was undertaking for the waters of Trefriw. A continental authority on natural waters had described them as being of value to the lymphatic, the neuropathic, the dyspeptic,



Terrace of Belle Vue Spa with the village of Trefriw.

The view from the terrace overlooking the Conway.

[*Photos by L.N.A.*

the convalescent, the tropical invalid, the tired brain worker, and the arthritic. Bath treatment would have its place at the new spa, and certain cases would benefit both by the waters and by manipulative treatment. Dr. Fox concluded with a quotation from Dr. Rutty: "How much could be done if our own people could be persuaded to lay aside their unrighteous prejudices against the productions of their own country."

Major GORONWY OWEN, Member of Parliament for Carnarvon, who took the chair, said that the decline in prosperity of Trefriw of late years, in spite of attempts to improve conditions, had been progressive. The new spa should give an opportunity for the town to reinstate itself.

Sir ARBUTHNOT LANE illustrated the difference between natural and artificial waters by a reference to sea water. Salt water, chemically indistinguishable from brine but artificially prepared, was fatal to fish. But if 2 per cent. of true sea water were introduced into the solution, fish could live in it without difficulty.

At the conclusion of his speech Sir Arbuthnot declared the spa open.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The Aberdeen Chair of Medicine.

ON the recommendation of the Secretary of State for Scotland the King has appointed Dr. Leybourne Stanley Patrick Davidson to be Regius professor of medicine, in the University of Aberdeen in the place of Prof. Ashley Watson Mackintosh, who has resigned.

Dr. Davidson, who was educated at Cheltenham and Trinity College, Cambridge, is 36 years of age and served with the Gordon Highlanders for three years during the late war, reaching the rank of captain. He was severely wounded and returned to his medical studies at Edinburgh in 1917, graduating with first-class honours two years later. He gained the gold medal for his M.D. thesis in 1925 and was elected a Fellow of the Royal College of Physicians of Edinburgh. Since 1927 he has been assistant physician to the Royal Infirmary, and for the past two years he has also been lecturer in systematic and clinical medicine in the university. After holding resident appointments he worked for three years in the department of bacteriology, and his earlier publications were largely bacteriological. His recent papers include several on pernicious anæmia published in THE LANCET, and a book on the same subject written in collaboration with Prof. Lovell Gulland.

Medical Service in the Highlands and Islands.

Your correspondent, "Viator" (April 26th, p. 939), calls attention to the absence of any superannuation assistance under the Highlands and Islands Medical Service. The Dewar Committee contemplated that, under a special scheme, it might be possible to enable certain parochial medical officers to retire. But it certainly made no recommendation about a contributory scheme of any kind. It is to be remembered that, under the Statute, each of the medical practitioners in agreement with the Highland and Islands Board (afterwards with the Board of Health, now the Department) was and is dealt with as an individual. No special schemes were ever approved for superannuation, or an allowance on retirement. In one or two extreme cases, I am informed, it was arranged to provide a parish with a second medical officer to overtake the more distant work, so relieving the older principal, whose obligations now covered a much smaller area. But no general arrangement of any kind was ever in force. If a contributory system were contemplated, the methods of subsidy would have to be materially altered.

"Viator" hopes "now the financial conditions are adequate, that a satisfactory scheme for superannuation of the medical officers will be granted by the Department in the interest of the efficiency of this essential medical service." It is proper to state that the Highlands and Islands Medical Service is not a whole-time State medical service. Under the various schemes subsidies are given to individual doctors in private practice and in no case does a man's whole salary come from the Fund. The practices are classified roughly into two types: First, where it is not possible for the doctor to earn a reasonable living for work done, the Fund supplements the salary to an accepted minimum net income. The number of these practices in 1923 was 35. Secondly, in other cases, the practitioner is compensated for such loss of income as he would incur if he attended distant patients at the same fee as near patients, these fees being specified by the Department. There are many large practices with poor areas. These practices would not normally require a subsidy; but the attendance on the more necessitous districts can be carefully estimated and compensation made on this estimate. The doctors must furnish details of their income confidentially and, where necessary, the amount of the subsidy is discussed confidentially with an officer of the Department. In this way arrangements have been made satisfactorily to the practitioners, and the Department are enabled to maintain an efficient practice.

On the terms of this system of subsidised individual practices a superannuation scheme would be somewhat difficult to frame. But under the new Local Government Act, another factor will enter into the case—namely, the consolidation of all the medical services under a large county authority. These official services will include the ordinary public health services, public assistance (medical), school health, maternity and child welfare, and the nursing services attached to all these. It will include also specialist services—surgical, medical, and dental. Schemes are already in existence under the H. and I. Fund to cover such specialist services and in each of three centres a consulting and operating surgeon has been established, chiefly at the expense of the Department. No doubt other such arrangements will ultimately follow. The re-grouping of hospital services will help this process. When the transitions to the new system are complete, it may become possible to establish at least a pro tanto superannuation scheme to cover certain officers. I believe that, although no such scheme has as yet been elaborated or even fully considered, the new conditions will compel attention to the matter, just as in the case of the medical officers of health and allied officers. Meanwhile, as indicated in the evidence laid before the late Royal Commission on insurance, arrangements are in force whereby practitioners in some single doctor areas are assisted to provide for the work of their practices during holidays. With the ear-marked part of the Fund, the Department of Health are able to give assistance about once in every three years to each of the practitioners eligible for the benefit. The Department's assistance normally relieves the doctor going on holiday of his deputy's fee and travelling expenses to and from the practices. The Department have power also to assist practitioners to attend post-graduate courses of study, but, according to the latest information available, there have been no applicants for such courses. The intention of the Department was and is to make the conditions of general practice in the Highlands as nearly as possible equivalent to the conditions in the Lowlands. In the Lowlands, it is well known, there is a fund under National Health Insurance to supplement the incomes of doctors in certain necessitous areas, many of which are really as much in need of a subsidy as are many parts of the Highlands.

The new scheme of concentrated local authorities is now proceeding satisfactorily in the Highlands, and there is little doubt that the matter of superannuation and holiday relief will not be lost sight of. One broad result of the many schemes is, whereas formerly

it was difficult to get an applicant for a vacant parish medical officership, now it is no uncommon experience to have 50 or 60 applicants to choose from. It should be added that, under the Act passed last session, the supplements to the Fund must be voted from year to year by Parliament. The sum is not limited and, from the tone of the report of the Committee on the Bill and from statements subsequently made by Ministers, there seems to be a general Parliamentary understanding that the supplementary sums from year to year shall make possible a really adequate surgical, medical, and nursing service for the whole Highlands. The total population involved in the Highland area, as defined by the Statute, is only some 320,000, and the number of practitioners involved is round about 150. Many of the Highland practitioners, of course, have not agreed to come under the schemes of the Department. This was not, at least at the outset, due to any opposition by the practitioners to the schemes as such, but simply to the fact that those practitioners were fully occupied in their private practices.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Resignation of Dr. H. T. Warnock.

Dr. H. T. Warnock, who has been for 50 years medical officer of the Donegal dispensary district, has just resigned that post. His resignation was accepted with regret by the County Donegal Board of Health, the members of which gave expression to their deep appreciation of the value of his services. Dr. Warnock has, indeed, for many years held a unique position in the north-west of Ireland. He has been the leading medical man in an area of several counties, and enjoyed the full confidence of the practitioners as well as of the public over that area. Outside his own district he has been well known in professional circles. He has given long service to the Council of the Irish Medical Association, and has filled the office of president. No medical man in Ireland is held in more general respect and affection.

The late Prof. J. P. Henry.

Dr. John Patrick Henry, or Seaghan P. MacEnri, as he was known of late, who died on April 16th, at Galway, was a man of varied activities, and of success in two different careers. Born in County Sligo, and educated at Trinity College, Dublin, he practised for several years in London as an ophthalmologist. He was for a time clinical assistant to the Royal Westminster Ophthalmic Hospital, and was honorary ophthalmic surgeon to the Italian Hospital, and oculist to the London School Board and the London County Council. He was greatly interested in the language and history of Ireland, and some 25 years ago he returned to Dublin and practised as an eye surgeon, devoting all his spare time to the revival of the Gaelic tongue as a spoken language. After some years in Dublin he was appointed to the two posts of professor of ophthalmology and otology, and lecturer in modern Irish in University College, Galway, National University of Ireland. He wrote several manuals for students of modern Irish, and was for a time president of the Gaelic League. He was reputed to be a ripe scholar of Gaelic, and he was enthusiastic in the movement of the Gaelic revival. At the same time he was a man of wide culture, and did not allow his enthusiasm to swamp his common sense.

The late Dr. William Hariot Mayne.

Dr. W. H. Mayne died on April 4th at his home in Warrenpoint, Co. Down. He was born in 1872, educated at Clifton College, Bristol, and took his medical course in the Richmond Hospital and Trinity College, Dublin, where he qualified in 1896. After some time spent at sea he commenced practice in Warrenpoint. Dr. Mayne was a man of wide interests. He was an extensive landowner, and took an active part in the political, social, and religious life of South Down. He was, moreover, a keen and prominent Freemason, and was at one time Provincial Grand Master of Down.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

The Degrees Controversy.

WHEN the scheme for an All-India Medical Council was prepared last year, the provincial Ministers were consulted. Largely, it is understood, because they were proud of their responsibilities, and feared that the scheme would interfere with provincial autonomy, they refused to accept it. The *Pioneer*, however, states that they unanimously supported the appointment of an inspecting officer, pending negotiations with the General Medical Council, and agreed to contribute funds for this purpose; but the Standing Finance Committee of the Assembly, in September, refused to assent to a token grant for the appointment, and when the question was brought forward in the Assembly itself direct opposition was at once apparent, and the proposal was dropped. Since that time, however, some progress has evidently been made. The Government of India has informed the Secretary of State that the local governments now agree that the only solution of the present difficulties is to be found in the establishment of an All-India Medical Council, and the Secretary for Education, in reply to a question in the Assembly on March 20th, undertook that every endeavour would be made to proceed with that project without any avoidable delay. But as had already been stated it would not be possible to introduce the necessary Bill during the present session. It is said that special measures are being concerted for the benefit of those students who will qualify at Indian universities during the next few months, and apart from this there is evidently no possibility of anything definite being done before the autumn. The breach is, therefore, so far as can be seen, likely to continue for some considerable time.

Feeling in the Assembly.

The fact that the critical stage of these negotiations coincided with a period of intense political unrest accounts for the failure to arrive at a provisional understanding, to tide over the period which must intervene before the projected council can become an accomplished fact. When the question was being debated in the Assembly feeling was running so high that non-medical politicians, who might under ordinary circumstances have been little interested took it up as a useful additional plank in their platform, and it ended by being dealt with more on racial and nationalistic than on medical grounds. One regrettable feature of the controversy has been the readiness of Indian medical men of good status—some of them holding the highest British qualifications—to enter the field in an uncompromising manner against the Government, the General Medical Council and even the Indian Medical Service, which has been several times dragged into the debate by main force though for what reason, except the mention of the name of one officer in connexion with the proposed temporary inspectorship, it is difficult to divine. The most eminent and successful of Indian practitioners seem unable to forget or forgive the former privileged position of the Service, even when alluding to the undoubted fact that they have now succeeded in displacing these officers from many of the most coveted appointments, and in some areas have absorbed most of the remunerative practice.

Suggested Retaliation in Bengal.

The recent rupture is the culmination of a whole series of arduous negotiations, any one of which

might have ended in disaster if it had not been for the goodwill of the General Medical Council and various official and non-official well-wishers in India, and the breakdown, now it has come, is all the more regrettable for that reason. It is difficult, in fact, to regard this deadlock with equanimity, in view of the quite hopeful prospect that an All-India Medical Council, which will be acceptable to the British council may be created within the next few months. Already some evil fruits of the rupture can be seen. In the January number of the *Calcutta Medical Journal* the editor, Dr. B. C. Roy (who holds the M.R.C.P. Lond. and F.R.C.S. Eng., and is a member of the Bengal Legislative Council) suggests retaliation, and comments with satisfaction on the situation which has now arisen. The withdrawal of recognition, and the difficulty of getting into the colleges in England, have already, he says, led a large number of Indians to go to continental Europe. They will come back enamoured of continental instruments and appliances. India imports some two crores worth of stores of this kind. Can we not, he asked, withdraw our orders on British firms so long as the present attitude continues.

Bombay.

In Bombay, also, and doubtless elsewhere, the same spirit is manifest. In the Bombay Legislative Council an eminent physician recently tabled a motion for adjournment of the House to discuss the situation which had arisen owing to the decision of the General Medical Council, and one member remarked that there could only be one answer to the challenge: that was to call upon all students to give up any intention of proceeding to British universities and to urge the Secretary of State not to insist on British qualifications in future. Here, again, strong feeling was shown, and the motion was carried in spite of Government opposition. Another able and highly qualified medical man, who is head of the King Edward Memorial Hospital and associated medical college in Bombay, has spoken still more forcefully. He wishes the Government of India to issue orders against the recruitment for the medical services of the country of persons holding British qualifications only, and calls for other energetic retaliatory measures. Some of this talk is no doubt beside the mark, but some of the material results may be of a permanent nature. Meantime, as was pointed out in the Bombay Legislative Council, newly qualified Indians will be debarred from practising or prosecuting their studies further in Britain, and no Indian will be eligible for a commission in the I.M.S. unless he qualifies for registration in Britain—surely a remarkable introduction to dominion status.

Abortive Efforts at Compromise.

The universities which are concerned in this question of recognition fall into two categories. Bombay, Calcutta, Lucknow and Madras, and the Punjab University, have previously been recognised, while the comparatively new institutions of Patna and Rangoon have never been accepted for registration. Recognition of new schools is a matter requiring careful consideration, but in the case of those already recognised it seems to many inside and outside India unfortunate that the Council has not felt justified, in view of the very important interests involved—and even, perhaps, having some regard to the present difficult political situation—in tiding over this crisis without resorting to extreme measures. The correspondence laid on the table of the Assembly on March 20th shows that the Indian Government, although they had been favourably disposed to the proposal, eventually were forced to the conclusion that the appointment of the Commissioner of Medical Qualifications suggested by the British council was out of the question, owing to the strong opposition manifested both in the Assembly and outside it, and therefore put forward an alternative scheme, framed by a conference of universities, for the creation of a very authoritative board, consisting of representatives of the Government of India and the medical faculties, as a temporary measure, for determining and supervising medical qualifications and standards. The board was to have as president the Director-General of the Indian Medical Service, and was to appoint three inspectors, specialists in their own subjects (medicine, surgery, and midwifery), who would have reported to the board, which would then have decided whether a guarantee should or should not have been given to the British council as to whether the medical degrees concerned implied the minimum qualifications accepted for registration in Great Britain. It is possible to realise the difficulties under which the General Medical Council has laboured in dealing with India, and the captious nature of much of the comment which has been levelled at the Council by Indian critics, and yet to regret that on this occasion the Council did not exercise a little more patience, in view of the gravity of the issues involved, and the efforts which have already been made, in many quarters, to meet their requirements. Buildings have been enlarged, equipment improved, the curriculum revised (very much on the lines desired by the Council), clinical facilities have been extended, and the numbers of students, which had become excessive during and after the war, reduced to reasonable proportions. If all this is taken into consideration it does not appear that any great risk would have been run by continuing recognition provisionally, to meet a critical situation such as the present.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Medical Economics.

Mr. M. M. Davis, director for medical services of the Julius Rosenwald Fund and a well-known economist, computes that the actual outlay of the American public because of sickness is not far short of 3,000,000,000 dollars. This is exclusive of the cost of the sickness in lost time, disability, and premature death, which items would quadruple the bill. Three billion dollars is a large sum, but is less than the sum spent yearly on tobacco and sweets. Of the total he estimates that $625,000,000 is paid to private practitioners, whose average gross income is $4500. More money is spend on drugs and appliances than is paid in fees. It has been estimated on good authority that at least two-thirds of the money spent in this way is wasted. That much of the necessary expenditure can be cut down by preventive medicine is shown by the fact that there are still 150,000 cases of typhoid fever each year, costing in sickness bills and loss of wages not less than $35,000,000. But it is not really the amount of the sickness bill so much as the distribution of its burden which gives rise to complaint. About half of the total burden falls upon a sixth of the population. Moreover, doctors' bills are usually the most unexpected and least provided for. Instalment payments are a partial solution. Many banks now make arrangements to accept undertakings for monthly payment of bills and credit the whole to the physician at a discount which pays them for the trouble and risk of collection. Private and mutual insurance companies are also helping to some extent to spread the burden of payment more evenly.

Commonwealth Fund Report.

The annual report of the Commonwealth Fund announces an interesting departure in policy. Grants are to be made available for the establishment of general hospitals in rural sections of the country where at present medical aid can only be obtained, if at all, from a considerable distance. Scholarships are to be provided for medical students who intend

to practise in rural areas and Fellowships for rural physicians who wish to take post-graduate courses. Thirty-five Fellowships are offered to graduates of British universities who want to study in America. In the five years since these Fellowships were first offered 758 applications have been received and 115 Fellowships granted. Large sums have been made available for mental hygiene, and especially child guidance clinics, both in England and in the United States.

Syphilis in New Orleans.

A recent study in the Charity Hospital of Louisiana has revealed a remarkably high incidence of syphilis in the general hospital population of negro males. In the out-patient clinic of this hospital some 50 new cases are seen each week. About 300 consecutive cases were fully investigated both clinically and serologically, while some 200 others were investigated by serum examination only. The most conservative estimate shows an incidence of 35·5 per cent. with syphilis, while if uncorroborated +2 Kahn reactions are included the percentage rises to 49·5 per cent. Even the latter figure does not include cases clinically syphilitic but serologically negative or cases rendered serologically negative by treatment. The investigators conclude that the incidence of syphilis for negro males in New Orleans is higher than for any group, white or coloured, that has been investigated. Dr. Thomas Parran, jun., who recently left the Division of Venereal Diseases of the U.S. Public Health Service to become health commissioner of New York State, has estimated the incidence of venereal disease for the whole country as 8 per 1000 whites and 11 per 1000 coloured.

MEDICINE AND THE LAW.

Certification of Cause of Death: Coroner's Rebuke Withdrawn.

THE difficulty of understanding the law of death certification and registration was illustrated afresh last month. Section 20 of the Births and Deaths Registration Act of 1874 directs the Registrar-General to furnish all registrars with printed forms of certificates of cause of death; the registrars are to furnish these forms gratis to all registered medical practitioners residing or practising in their sub-districts. The section goes on to direct that, in case of the death of any person who has been attended during his last illness by a registered medical practitioner, the practitioner shall sign and give (to some person required by the Act to notify the death) a certificate stating to the best of his knowledge and belief the cause of death. This statutory duty was not altered when the law of births and deaths registration was altered in 1926, except that new provision was made for prescribing the forms, and that the registered medical practitioner on signing the certificate is now required to deliver it forthwith to the registrar and also to give written notice of the signing of the certificate to some person required by the Registration Acts to give information of the death. This 1926 alteration, it will be seen, does not affect the obligation on the attendant practitioner (under Section 20) to sign and give the certificate of cause of death. It was therefore not without surprise that doctors read of a rebuke administered by the South London coroner on April 7th to a practitioner who had merely discharged his statutory duty. Dr. James Manley, giving evidence at an inquest on that date upon the death of a licensed victualler at Clapham, stated that he had issued a certificate showing the cause of death to be alcoholism. From the newspaper report it appeared that he was somewhat sharply told by the coroner that he should not have done so, and must not do so again. A fortnight later the coroner withdrew the rebuke, admitting that he had overlooked Section 20 which has been the law since 1874. He took occasion, however, to criticise the law as "unfortunate," since the statute implied that in all cases, even murder, it is the duty of the practitioner to give a certificate which would be stopped by the registrar, thus causing delay and inconvenience. The coroner added that he thought it would always be wise for medical men issuing death certificates to notify the coroner of these cases which did not appear to be due to natural causes. The coroner can hardly have overlooked Part IX. of the code of consolidated Regulations of 1927, which provide the machinery by which the registrar refers such cases to the coroner before registration. As Parliament, the Registrar-General, and the Minister of Health have carefully prescribed the exact duties of the practitioner and the registrar, doctors will be well advised to comply with their statutory obligation as it stands rather than to concern themselves with alternative or supplementary duties under the law as it would be if improved.

Public Health Services.

SMALL-POX IN LEICESTER.

THE Health Committee of the Leicester Corporation reports that small-pox, which reappeared in the City during the last quarter of last year and succeeded in establishing itself, has further increased during the first quarter of the present year. The total number of cases reported by medical practitioners or discovered by the Health Department staff is 416 to date, a greater number than ever previously recorded. Fortunately, the disease has remained of the favourable type described in a previous report. The actual "illness" usually consists of a few days in bed, during which the symptoms closely resemble an attack of influenza. On appearance of the eruption, which in most cases is very sparse, the constitutional symptoms disappear, and the patients feel quite well again. They are then tempted to return to work, and if not under medical attendance they sometimes do so. The very mildness and triviality of so many cases has made it difficult to prevent the spread of the disease, as many cases continue to go about with the disease on them. Dr. Killick Millard, medical officer of health, believes that the present disease is a distinct variety of small-pox which breeds true, and if this is correct there is no danger of its giving rise to the severe and fatal kind of small-pox which formerly prevailed in this country. Of the 416 cases, 145 were under 16 years of age, 173 were between 16 and 30 years, and 98 were over 30 years of age; 189 were males and 227 were females. Of the cases over 30 years of age, 60 were females and 38 were males. This difference in sex is accounted for by the number of men in Leicester who were vaccinated whilst serving in the army during the war. With the exception of two doubtful cases last year, not one of the men who were vaccinated during the war has contracted the disease. The extra work thrown upon the staff of the Health Department by the outbreak has necessitated the appointment of a temporary assistant to the medical officer of health.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 19TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 345 (last week 423); scarlet fever, 2022; diphtheria, 1246; enteric fever, 78; pneumonia, 1058; puerperal fever, 41; puerperal pyrexia, 82; cerebro-spinal fever, 12; acute poliomyelitis, 5; acute polio-encephalitis, 1; encephalitis lethargica, 10; dysentery, 5; ophthalmia neonatorum, 97. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on April 22nd–23rd was as follows: Small-pox, 542 under treatment, 26 under observation (last week 560 and 31 respectively); scarlet fever, 2060; diphtheria, 2669; enteric fever, 27; measles, 1103; whooping-cough, 61; puerperal fever, 28 (plus 19 babies); encephalitis lethargica, 120; poliomyelitis, 1; "other diseases," 23. At St. Margaret's Hospital there were 17 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was one death from small-pox, 5 (1) from enteric fever, 116 (57) from measles, 7 (1) from scarlet fever, 30 (5) from whooping-cough, 44 (5) from diphtheria, 44 (11) from diarrhœa and enteritis under two years, and 42 (6) from influenza. The figures in parentheses are those for London itself.

The death provisionally classified to small-pox was assigned to Stepney (Metropolitan Borough). The deaths from enteric fever outside London were reported from Edmonton, Ashton-under-Lyne, Sunderland, and Tynemouth. Fatal cases of measles were widely distributed, with larger numbers at Salford 7, Liverpool 6, Middlesbrough 5 (Glasgow reported 13). Whooping-cough claimed 4 victims at Birmingham, 3 each at Bradford and Middlesbrough. Four deaths were attributed to influenza at Manchester.

The number of stillbirths notified during the week was 260 (corresponding to a rate of 42 per 1000 births), including 50 in London.

FATAL CASES OF SMALL-POX.

The fatal case of small-pox reported in last week's return from Leeds was that of a woman, aged 77 years, who had been some time in the infirm ward of St. James's Hospital. Dr. J. Johnstone Jervis, medical officer of health, tells us that the primary cause of death was "cerebral hæmorrhage," and the secondary, "variola." "It was," he adds, "unfortunate that the disease was introduced into this hospital, and especially amongst the old people, because some of them are very infirm and unable to resist acute infection of any sort. So far that has been the only death."

The death in Camberwell was that of a female infant, aged 9 months, whose certified cause of death, Dr. H. W. Barnes informs us, was: (*a*) bronchial pneumonia; (*b*) pertussis; (*c*) small-pox (not vaccinated). No post-mortem examination.

In this week's return the fatal case is that of a woman of 47, the widow of a crane-driver at the docks. The date of onset was April 3rd, the rash appeared on the 5th, when she was removed to Joyce Green Hospital, where she died on the 12th. We learn from Dr. J. M. Browne, acting medical officer of health, that the death return was filled up thus: 1. (*a*) Myocarditis; (*b*) cerebral thrombosis. 2. Small-pox (vaccinated in infancy); no p.-m.

ROYAL MEDICAL BENEVOLENT FUND.—At a recent meeting of the Committee, 45 grants were made, amounting to £973 10*s*. The following were some of the cases helped:—

M.B., aged 31. Started in general practice three months ago. She did not buy a practice but put up a plate. She spent her last penny in fitting up the surgery, the rent having been guaranteed by friends for a time. All went well and the practice increased, but she has broken down in health and is suffering from tuberculosis of the lungs. Sanatorium treatment is necessary and financial help was asked for. Fund voted £26 to be paid in two instalments during the next six months, when the case will be reconsidered.

M.D., aged 25. She has held four resident hospital appointments since qualifying. She is now suffering from pulmonary tuberculosis, complicated by tuberculous laryngitis. Fund voted £20. Further consideration will be given.

M.B., aged 43, married. Has been suffering from diabetes mellitus since 1927. Pulmonary tuberculosis was diagnosed in April, 1929. In the past it is known that he gave his services in the cause of charity, and has seen patients on the books of this Fund on request. Fund voted £52 over a period of six months.

Widow, aged 38, of M.B. Husband served in R.A.M.C. till 1920. He then went abroad as medical officer to a railway. After a short illness he died of pneumonia at the age of 37. The widow is left without means, and has a boy of 7 to educate. Fund gave an emergency grant of £5 immediately, and a further grant of £26, payable during the next six months. The R.M.B.F. Guild will also give help towards the education of the boy.

Widow, aged 41, of M.B. Husband died recently of tuberculosis at the age of 40, leaving his widow practically penniless, with a boy of 5 to educate. Fund voted a grant of £26 and special gift of £10.

Subscriptions and donations are very urgently needed in order that the activities of the Fund may be continued and applicants given the help they need. Cheques should be forwarded to the Hon. Treasurer of the Fund at 11, Chandos-street, London, W. 1.

Correspondence.

"Audi alteram partem."

A UNIVERSITY DEGREE FOR THE GENERAL PRACTITIONER.

To the Editor of THE LANCET.

SIR,—London and her University are becoming more and more the centre of learning in the Empire, attracting students and post-graduate students from all parts of the Empire, and, indeed, from the other countries too. With the establishment in London, at the Hammersmith Hospital, of a great Empire post-graduate hospital and medical school, connected with the University of London, will come the necessity for that university to carefully review the present regulations under which her medical degrees are obtainable, and to revise them, so that they are no longer preserved as stem-ginger in sealed jars, but are thrown open to students from all over the world upon reasonable conditions.

Your correspondent, "M.D., M.R.C.P.," has touched upon the one point which requires immediate attention and, as he rightly points out, the class most urgently in need of consideration is that of the qualified and duly registered medical practitioner. No doubt 90 per cent. of medical men and women are general practitioners, yet the regulations are drawn up and guarded by the other 10 per cent. of hospital specialists and academic professional gentlemen out of touch with our needs. A reputable M.D. degree should be available upon reasonable terms in this country for every duly registered general practitioner of 30 years of age and seven years' practice. It is this degree, an M.D. degree in general medicine for general practitioners, which should be established by the University of London and made available, after a period of post-graduate study, for students from all over the world. With the establishment of this great central post-graduate institution it will be incumbent upon the University of London to exercise more imagination than has been done in the past, to take a broader and a wider view, to become less academic but more practical, and having had a share in providing the facilities for post-graduate instruction, to provide at the same time the necessary hall-marks of that study when undertaken.—I am, Sir, yours faithfully,

CHARLES A. H. FRANKLIN, M.D.,
April 26th, 1930. General Practitioner.

TONSILLECTOMY BY DIATHERMY.

To the Editor of THE LANCET.

SIR,—In your issue of April 19th (p. 859) Dr. Warner Collins describes the successful removal of tonsils by diathermy. I have used this method myself in cases where the patient for some reason could not have the tonsils dissected out. But I think it will be agreed that it should not be used in preference to a *complete* dissection, since it may leave behind scarred and infective lymphoid tissue, or even deep pus, as in other methods. Tonsils are easily removed by dissection under a local anæsthetic in an adult at one sitting. The operation is as easy as under a general anæsthetic, and the recovery at the finish of the operation is more comfortable for the patient and the nursing staff. Many patients in this country are averse to local anæsthesia. Nevertheless, if there is no recent acute infection, nor dental sepsis, if the dissection is done without roughness and with a preservation of the mucous membrane from the surface of the tonsils, and if the fossæ are kept clean by gargling and cleansing with hydrogen peroxide little discomfort will result, and certainly no malodorous slough or secondary hæmorrhage.

Diathermy used with a fine tool is very useful for severing the vessels that enter the capsule as the tonsil is being dislocated during the dissection.

I am, Sir, yours faithfully,
C. HAMBLEN THOMAS, F.R.C.S.

Harley-street, W., April 23rd, 1930.

THE STETHOSCOPE IN THE DIAGNOSIS OF PULMONARY TUBERCULOSIS.

To the Editor of the LANCET.

SIR,—In the LANCET of April 19th (p. 872) there is a reference to some remarks by Dr. J. Gravesen, of Vejlefjord, on the lack of usefulness of the stethoscope in the diagnosing of pulmonary tuberculosis. All sanatorium physicians of experience must have been aware of this for some years; indeed, the more attempts which have been made to establish a diagnosis of this condition without the consideration of symptoms the later has the disease been discovered, and such methods as looking for tubercle bacilli, though still insisted on in some quarters, are really a policy of despair. Even the X ray method is not reliable, as was recently shown by Dr. F. G. Chandler in your own columns,[1] where he tells us of a case with hæmoptysis together with the finding of tubercle bacilli in the sputum in which the X ray picture was normal. It should be remembered that there are X ray pictures and X ray pictures; there are also interpretations and interpretations of the same, with the result that a patient may be put to both unnecessary expense and unnecessary danger through having to leave his bed when he may be suffering from symptoms indicating activity of disease, perhaps to travel a considerable distance and at the end to be told (quite incorrectly) that he has nothing the matter with him, although he himself is feeling desperately ill. The advantage of considering symptoms is that by their means it may be possible to come to a diagnosis; at the same time it is from symptoms that we are able to decide, whatever the physical findings may be, the urgency or otherwise of treatment. A rectal temperature measurement is a great assistance in diagnosis and essential for treatment. When there are few physical signs combined with symptoms of toxæmia then the prognosis is grave.

I have no doubt that pulmonary tuberculosis has changed very considerably in the last 30 years. As a serious affection it seems to be dying out. In Ayrshire the number of deaths registered in one year as due to pulmonary tuberculosis has fallen to 126 out of a population of 300,000. As we admit to this sanatorium about 220 cases a year and have other beds elsewhere to the number of about 60, it would appear that the disease is well in hand. Nevertheless, at the present moment I have a waiting list of about 30.

I am, Sir, yours faithfully,
EDWARD E. PREST.

Ayrshire Sanatorium, New Cumnock, April 26th, 1930.

[1] THE LANCET, March 15th, p. 588.

BRADFORD ROYAL INFIRMARY.—In 1929 there were 7953 casualty patients, and 49,712 treatments in the massage and remedial exercises department, an increase of more than 4000. The average weekly cost of each in-patient (3845) was £2 15*s.* 1*d.*, a merely fractional increase. They stayed on the average 22·5 days.

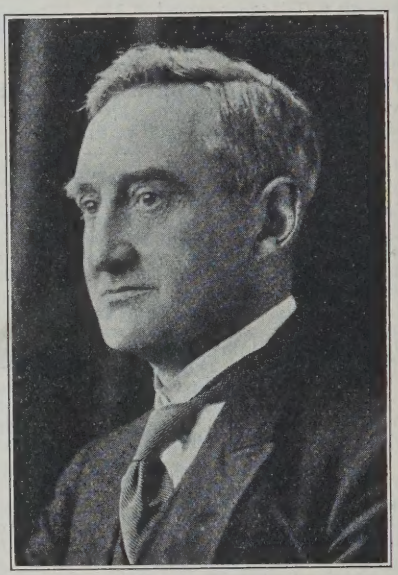
LANDSCAPES IN A HOSPITAL WARD.—An extension of Kingston-on-Thames Victoria Hospital was opened recently by Mrs. Leonard Bentall, whose husband has contributed extensively to the work, which has cost £13,000. The enlargements include a children's ward of nine cots—children have hitherto occupied adult wards—and nine private wards (10 beds), for paying patients. The walls and ceiling of the children's ward are painted with landscapes combining water, hills, and woodlands—a decoration which is said to be unique in an English hospital.

Obituary.

FREDERICK EDWARD WYNNE, B.A., M.B. DUB., D.P.H.

Dr. F. E. Wynne, whose death on April 22nd was recorded in our last issue, had only been ill for a few days, and his death at 56 years of age cuts short a career of unusual value in the service of public health.

Frederick Wynne was born at Kilkenny in 1870, fourth son of the Rt. Rev. F. R. Wynne, D.D., Bishop of Killaloe, and followed his elder brother, John Darley, to Trinity College, Dublin, where both graduated in arts and medicine, the younger in 1894. His course was distinguished, for he took the Hudson scholarship and was gold medallist at Adelaide Hospital, where he later served for a time as resident officer, and he was hon. secretary of the University Biological Society. After further experience at the Rotunda Hospital he migrated in 1896 to Leigh, in Lancashire, where he started in practice and held the position of hon. surgeon to the local infirmary. General practice obviously did not give him the scope he desired, for from his student days he was a fluent and persuasive speaker, of great versatility in debate, and he began to be conscious of gifts of propaganda and organisation which would have readier outlet in public service. In 1909 he was appointed first full-time medical officer for Leigh, and three years later went on to Wigan, where he remained throughout the period of the war until in 1921 the opportunity offered of succeeding Dr. Scurfield as medical officer of health for Sheffield. At Wigan he combined the duties of medical officer of health, tuberculosis officer, chief school medical officer, and superintendent of the infectious diseases hospital, and when he left he was engaged in establishing a further hospital of 72 beds for the treatment of tuberculosis. It was at his instigation that the Wigan Corporation maintained its own herd of milch kine. As soon as war broke out in 1914 Dr. Wynne obtained a commission in the R.A.M.C., and was detailed for service in Egypt, where he became divisional sanitary officer to the Expeditionary Force.



DR. F. E. WYNNE.

[*Photograph by Lafayette.*

For the remaining nine years of his life he impressed his personality on the sanitary services of Sheffield. Open-air life and freedom to breathe and live properly never had a stronger advocate. Schemes of clearance and rehousing always had his warm support, and his interest extended to such minutiæ as the paving of yards and courts, and to the small amenities which determine the hygienic life of a community. His name soon became well known in the city, for he was not only frank and outspoken but wilfully put

his teaching into provocative form and revelled in the appearance of heterodoxy. At regular intervals he hurled what he called medical bombshells which continued to crackle for weeks at a time in the columns of the local press. He was equally uncompromising in professional circles, as in an address given at Glasgow in 1922 when he supported the thesis that the tax- and rate-payer is being bled by expenditure which produces no adequate return in improved health and prolonged life. In the following year at Hull he asked: "Should infant mortality be reduced?" not mincing words in condemning sentimental propaganda in favour of unlimited production of babies. Nevertheless he concluded with the admission that a reduced rate of infant mortality may itself prove a factor in bringing about the desired reduction in the birth-rate. No doubt his public work was coloured by his views on democracy, for, though geniality and kindness itself in all personal relations, he was an aristocrat at heart, and held to the paramount value of heredity and the permanence of sound germ-plasm.

Wynne's literary urge took him early, for when barely qualified he contributed "The Blacklegs of the Jerry Pit" to *Chapman's Magazine*, soon followed by "A Conversion and Its Sequel." While still at Leigh he wrote his first two novels, "Faith Unfaithful" and "Fortune's Fool"; a play called "Subsidence," full of local colour, was produced at the Gaiety Theatre in Manchester. "Mediterranean Mystery" was perhaps his best work of fiction, but "Digby's Miracle," which appeared in 1924, could only have been written by a medical man, for it tells of a village practitioner, by training and inclination an experimental physiologist, whose special knowledge finds limited scope until it enables him to organise a miracle by restoring sight to an hysterical girl through the curative waters of an old well. His easy exposition found play in a scholarly little book on "Ductless and Other Glands," embodying the results of endocrine research, and recording his own view that old age might be as physiological a period as any other, and probably no less pleasant, if youth and maturity were rightly used. He wrote many articles on public health subjects for the press, and was for many years a medical correspondent of the *Manchester Guardian*.

Dr. Wynne held many offices. He was professor of public health in the University of Sheffield, a member of the Senate, and presided for some time over the north-western section of the Society of Medical Officers of Health. Only recently he laid down the position of hon. pathologist and bacteriologist to the Wigan Infirmary.

He leaves a widow and three sons.

SHEFFIELD ROYAL INFIRMARY.—The annual report states that the annual cost per patient in 1929 was £147 6*s*. 2*d*., an increase of £6 3*s*., but that at £6 14*s*. 7*d*. the cost of each in-patient fell by 11*s*. 1*d*. Out-patients cost 4*s*. 5*d*. each, a reduction of 7*d*. In the Godfrey Walker convalescent home each in-patient cost £81 15*s*. 2*d*., an increase of £1 16*s*. 3*d*. Close coöperation between the Sheffield municipal and voluntary hospitals has been assured by the creation of a joint advisory committee composed of lay and medical representatives of each.

DONATIONS AND BEQUESTS.—Mrs. Sophia Longley, of Lydhurst-avenue, Streatham-hill, S.W., left £500 each to Guy's Hospital, St. Thomas's Hospital, and St. Bartholomew's Hospital.—Mr. George Bridcut of Yew Tree House, Ombersley, Worcestershire, left 1000 guineas each to Middlesex Hospital and the Worcester Infirmary.—Mr. J. F. W. Deacon, J.P., hon. treasurer of the London Lock Hospital and Home, has made a donation of £500 to its funds, and The Worshipful Company of Goldsmiths had made a grant of £200 to this institution. The following legacies have been bequeathed to the institution: £100 from the late Mr. George Toller, and £10 from the late Mr. Henry Kruger, of Liverpool.—Sir William Milligan, M.D., LL.D., of Westbourne, Rusholme, Manchester, who left unsettled property of the value of £293,470, bequeathed his medical library to the University of Aberdeen.

Medical News.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—At an ordinary quarterly Comitia of the College held on April 24th, with Sir John Rose Bradford, the president, in the chair, the following members of the College were elected to the Fellowship:—

Ralph Henry Crowley, Charles Hunter, Leonard George Joseph Mackey, Edward Burton Gunson, William Wilson Jameson, Arthur John Scott Pinchin, Adolphe Abrahams, Alan Worsley Holmes à Court, Thomas Archibald Malloch, Arthur Peregrine Thomson, Graham Selby Wilson, Henry Wallace Jones, James Calvert Spence, William Brown, Archibald Edmund Clark-Kennedy, Hugh Reginald Dutton, James Purdon Martin, Macdonald Critchley, and Arthur Salusbury MacNalty.

The following were nominated by the Council under By-law XXXVIII (b):—

Walter Ernest Dixon, John James Rickard Macleod.

The following candidates were admitted Members of the College:—

Anthony Dominic Abdullah, Edward William Anderson, Lennox Gordon Bell, Charles Allan Birch, Edward John Cronin, John Nathaniel Cumings, Amar Nath Duggal, John Lawrence Howland Easton, Phyllis Victoria Lillia Epps, Florence Margaret Gamble, Stanley Jack Hartfall, Albert Joseph Hawe, Catherine Mary Hext, Thomas Alexander Alfred Hunter, Simon Kin, Isabella Louise Hamilton Livingstone, Murdo Mackenzie, Lucy Margaret Theodora Masterman, Swithin Pinder Meadows, Thomas Morton, George White Pickering, Max Michael Posel, Charles Frank Shelton, William Arklay Steel, Arthur Goronwy Watkins, and Henry Yellowlees.

Sir John Rose Bradford was appointed to represent the College at the Jubilee Celebrations at the University of Manchester on May 23rd.—By a resolution of the College the President was asked to convey a vote of condolence to the family of the late Poet Laureate, Robert Bridges, O.M., who was a Fellow of the College.

It was reported that with the concurrence of the President the Medical Department of the Admiralty have awarded the Gilbert Blane Gold Medal for 1930 to Surg.-Lieut. Commander J. F. H. Gaussen.

Dr. R. A. Young was appointed Representative of the College at the Sixteenth Annual Congress of the National Association for the Prevention of Tuberculosis to be held July 3rd to 5th.—Dr. William Hunter was appointed to represent the College on a Committee of the People's League of Health to consider the Cause and Eradication of Bovine Tuberculosis.

Licences to practise were conferred upon 142 candidates (124 men and 18 women) who have passed the Final Examination in Medicine, Surgery, and Midwifery of the Conjoint Board and have complied with the by-laws of the College. The following are the names and medical schools of the successful candidates:—

M. Ata Ullah, Punjab and Charing Cross; H. B. Bagshaw, Cambridge and London; G. N. Bailey, Cambridge and St. Thomas's; A. H. Baker, Manchester; J. E. G. Baker, London; A. N. Barker and F. Bartholomew, St. Thomas's; G. R. Bashford, Birmingham; D. A. Beattie, St. Bart.'s; D. H. Bolton, St. Thomas's; A. E. Bowling, Leeds; Mabel Brewster, Royal Free; R. O. Brooks, Manchester; C. C. Bryson, Cambridge and Middlesex; A. Burkhardt, Univ. Coll.; C. E. Burridge, Birmingham; G. G. Cameron, Guy's; S. N. Chopra, Punjab, Edinburgh, and Middlesex; D. S. Chowdhary, Punjab and London; J. F. Coates, Bristol; A. F. H. Coke, St. Mary's; Charlotte A. G. Conway, Royal Free; J. H. Conyers, Cambridge and St. Thomas's; Margaret E. Cook, Royal Free; H. Coorland, St. Bart.'s; H. D. Cronyn, St. Mary's; H. Curtis, Cambridge and St. Thomas's; A. L. d'Abreu, Birmingham; C. M. Dell, St. Thomas's; W. J. D'Rosario, Madras and Guy's; P. G. Dowdell, Univ. Coll.; J. C. E. Dusseau, Toronto; J. J. Eapen, Madras and Birmingham; R. E. M. Fawcett, St. Bart.'s; Sheila J. Ferguson, King's Coll.; F. H. H. Finlaison, R. H. Fish, and E. D. Forster, Cambridge and St. Thomas's; E. V. Frederick, St. Bart.'s; J. D. J. Freeman, St. Thomas's; W. W. Gerrard, Liverpool; P. R. Graves, St. Thomas's; S. R. Gunewardene, Ceylon and Univ. Coll.; H. C. Halge, Madras and St. Mary's; C. J. K. Hamilton, Cambridge and Liverpool; D. Hay, Cambridge and St. Bart.'s; Geraldine J. G. Hayes, Manchester; Columba M. D. Heathcote, Charing Cross; J. Henry, Leeds; J. R. Hindmarsh, Durham; Cicely L. Hingston and S. W. Holmes, St. Mary's; Ethel E. Hopper, Charing Cross; L. H. Howells, London; K. N. Irvine, Oxford and St. Thomas's; O. Ive, Guy's; L. A. Jacob, Madras and St. Thomas's; M. M. St. G. Johnstone, Cambridge and St. Thomas's; E. G. M. Jones, Univ. Coll.; C. Jotikasthira, St. Thomas's; C. C. Kapila, Rangoon and Charing Cross; N. F. Kendall, St. Bart.'s; J. D. Kershaw, Univ. Coll.; S. Lal, Punjab and Middlesex; F. P. L. Lander, Middlesex; Grace Law, King's Coll.; R. H. Leaver, St. Bart.'s; E. Z. Levy, Manchester; G. S. R. Little, St. Bart.'s; J. B. Lloyd, London; H. Lwow, Vienna and St. George's; H. G. McComas, Guy's; S. McDonald, Cambridge and Durham; W. McKissock, St. George's;

R. W. Malim, Cambridge and St. Thomas's; Margery L. Maltby, Royal Free; M. Mandelstam, Oxford and St. Bart.'s; R. S. Mann, Cambridge and Univ. Coll.; C. E. P. Markby, Cambridge and St. Thomas's; J. H. G. Mason, Middlesex; C. B. Melville, Melbourne and Guy's; J. B. S. Morgan, Cardiff and St. Bart.'s; F. Murray, London; F. J. Napier, Guy's; Alonzo M. Nodine and A. M. Nussbrecher, Middlesex; R. Nutt, Oxford and St. Thomas's; C. L. Oakley, Univ. Coll.; G. L. Ormerod, Cambridge and St. Thomas's; M. Owen, Cardiff and Univ. Coll.; P. M. Oxley, St. Bart.'s; C. H. Pauli, Bristol; D. D. Payne, St. Thomas's; M. Phillips, London; F. E. Pilkington, Cambridge and King's Coll.; J. R. F. Popplewell, Guy's; J. O. Poynton, Cambridge and Charing Cross; A. C. Price, Guy's; S. Ramadas, Bombay and St. George's; S. Ramanathan, Ceylon and King's Coll.; G. E. Ranawake, Ceylon and Middlesex; J. M. Reese, St. Mary's; J. I. Rerrie and A. H. T. Robb-Smith, St. Bart.'s; H. E. W. Roberton, Cambridge and St. Bart.'s; C. G. Roberts, Cambridge and Westminster; Victoria M. Robinson, Oxford and King's Coll.; J. D. Rose, Durham; Pattie E. Rose, Royal Free and St. Mary's; K. M. Ross, St. Bart.'s; C. A. Rumball, Guy's; J. Sakula, Middlesex; K. T. Samatapala, Ceylon and King's Coll.; S. Scher, Cape and Univ. Coll.; L. Seaton, Leeds; K. M. Seedat, Bombay and Charing Cross; M. H. Shah, Punjab and Univ. Coll.; Ursula Shelley, Royal Free; Edna F. Sheridan, King's Coll.; L. Silman and S. Silman, Leeds; Phyllis F. L. Simon, Royal Free; J. G. Sleigh, Cambridge and King's Coll.; Edith M. P. Smith, Cambridge and Charing Cross; P. Somasunder, Madras and London; B. Southwell, Guy's; G. H. G. Southwell-Sander, Cambridge and St. Thomas's; T. M. Spilhaus, St. Thomas's; J. K. Stanger, Durham; R. W. Stephenson, Guy's; B. P. Sur, Calcutta and Edinburgh; F. H. Taylor, Durham; G. Taylor, Manchester; J. N. Vasudeva, Punjab and St. Thomas's; L. H. Wharton, Bristol; J. C. G. Whitelaw, Cambridge and St. Thomas's; D. A. Williams, Cardiff and Univ. Coll.; Rose E. Williams, Royal Free; F. S. Winton, Cambridge and St. George's; Joyce R. Woods, Royal Free; G. R. H. Wrangham, St. Mary's; and W. Young, Cardiff and St. Mary's.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates were successful:

Surgery.—R. P. Davies, Cardiff and London Hosp.; M. Halperine, Paris and London Hosp.; J. E. R. Heppolette and C. G. Muller, St. Mary's Hosp.; E. G. Nair, Manchester; and L. J. Pearson, Birmingham.
Medicine.—J. Britanischski, London Hosp.
Forensic Medicine.—J. S. Bury, Manchester; H. Glynn, Charing Cross Hosp.; J. M. L. Love, St. Mary's Hosp.; and A. W. B. Wiggins, Sheffield.
Midwifery.—E. C. Dymond and C. Seeley, St. Mary's Hosp.; G. R. Germany, Sheffield; E. G. Nair, Manchester; and G. Wilsker, Leige and Royal Free Hosp.

The Diploma of the Society was granted to the following candidates, entitling them to practise Medicine, Surgery, and Midwifery:—J. S. Bury, E. G. Nair, and L. J. Pearson.

UNIVERSITY OF LONDON.—At recent examinations the following candidates were successful:—

D.P.M.

With Special Knowledge of Mental Deficiency.—C. J. C. Earl.
With Special Knowledge of Psychiatry.—Beryl Senneck.

University College.—The six lectures on Special Sense Physiology, to be given by Dr. R. J. Lythgoe, will be at 5 P.M. on May 15th, 20th, 22nd, 27th, and 29th, and on June 3rd. Those by Prof. F. G. Cole, F.R.S., on the Early History of Generation and Comparative Anatomy will be at 5.30 P.M. on May 7th, 8th, 14th, 15th, 21st, and 22nd. Dr. W. E. Blatz, assistant professor of psychology in the University of Toronto, will deliver a lecture on Modern Theories in Habit Training in the Pre-School Child, on Tuesday, May 13th, at 5.30 P.M.

BRITISH INSTITUTE OF RADIOLOGY.—The annual general meeting of this institute (incorporated with the Rontgen Society) will be held at 32, Welbeck-street, London, W., at 8.30 P.M., on Thursday, May 15th. Dr. Peter Kerley will read a paper on the Pathology of Early Pulmonary Tuberculosis as revealed by X rays. On the following morning provincial members are invited to visit the Westminster Hospital Annexe (Radium) 66, Fitzjohn's-avenue, Hampstead, N.W.

LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY.—The annual general meeting of this Society was held at Victory House, Leicester-square, on Wednesday last, April 30th, Sir John Rose Bradford, the president of the Society, being in the chair. In moving the reception of the annual report Sir John pointed to the increasing adherence of the profession to the Society, nearly a thousand new members having been elected during the year, while the large sums of money paid in defending and maintaining the interests of the members was proving the absolute necessity of organisation for protecting medical men from many of the risks associated with professional life. The annual report, statement of accounts, and balance sheet having been received and adopted, the president and the principal officers were unaminously re-elected for the ensuing year.

NAVAL MEDICAL COMPASSIONATE FUND.—At the quarterly meeting of the Directors of this Fund on April 24th the sum of £180 was distributed among the several applicants.

SOCIETY OF RADIOGRAPHERS.—At a meeting of this society to be held at 32, Welbeck-street, London, W., at 7 P.M. on Wednesday, May 14th, Mr. C. H. Holbeach will read a paper on the Planning of an X Ray Department.

INVALID CHILDREN'S AID ASSOCIATION.—The annual meeting of this association will be held at 18, Carlton House Terrace, on Tuesday, May 6th, at 3 P.M., with Viscount Goschen in the chair. Among the speakers will be Dr. F. E. Fremantle, M.P., and Sir Charters Symonds. Admission is by ticket only, and the Secretary's address is 117, Piccadilly, W. 1.

RETIREMENT OF MR. E. W. MORRIS.—It is announced that Mr. E. W. Morris, House Governor of the London Hospital, will retire from that position in July next. Mr. Morris, who has been House Governor since 1903, is the author of "A History of the London Hospital."

WALSALL ISOLATION HOSPITAL.—The Mayor of Walsall has formally opened the first portion of a new isolation hospital for the county borough at Goscote, a short distance from the town. The building, which is to cost £30,000, contains a block of 34 beds for scarlet fever and diphtheria, and a block of ten beds for mixed isolation cases. There will eventually be 100 beds.

CONTRIBUTORY SCHEMES IN YORKSHIRE.—The Yorkshire voluntary hospitals committee has approved of a proposal that every hospital in the county should have a scheme of regular contributions, framed according to the conditions of the district, patients to be entitled to full privileges in any hospital, irrespective of whether it is that to which they contribute.

NORFOLK AND NORWICH HOSPITAL.—Since the war the number of beds has been nearly doubled, and several additions have been made to specialist departments, but the accommodation for a greatly increased nursing staff has not been increased for nearly 30 years. Unless the accommodation is augmented it will be impossible to provide nurses for the new eye, ear and throat ward now being erected. It has, therefore, been decided to appeal for £40,000 for the extension of the nurses' home. The people of Norfolk subscribe to the hospital at the rate of nearly two shillings per head of the entire population.

HOSPITAL ACCOMMODATION AT PLYMOUTH.—Mr. Arthur Greenwood, the Minister of Health, on April 12th laid the foundation-stone of an extension of the Plymouth Mental Hospital at Blackadon, and of new nurses' quarters at Swilly Hospital. The work at Blackadon is part of a scheme of extension which, when completed, will cost £129,000 and accommodate 839 patients. At present the mental hospital, which contains an average of 515 patients, is overcrowded to the extent of 76 patients, while a further 162 are boarded out.

PRINCESS ALICE HOSPITAL, EASTBOURNE.—At the annual meeting of this hospital it was stated that although there had been another big increase in the number of in patients, the governors thought it inadvisable to venture on any scheme of enlargement until time had elapsed in which to gain experience of the working of the Local Government Act. This also applied to a contributory scheme and nurses' superannuation. The year's finances showed an increase of ordinary expenditure over ordinary income of £993, despite great attention to economy. The governors decided that legacies should not, in future, be consumed in paying off deficit, but invested to provide an annual income.

THE NEW SUSSEX HOSPITAL.—A year of steady growth and improvement was reported at the annual meeting on April 2nd of the New Sussex Hospital for Women and Children at Brighton. The 12 months' working marked a deficit of £214, and a total overdraft (including this sum of £614 at the bank; but it was pointed out that but for the adoption of the federated superannuation scheme for nurses, and the trebling of the rate demand under the new assessment, the expenses would have been met. A special appeal is to be launched to meet the deficit; also for a considerable sum to cover urgent repairs. During 1929 a new wing was in full occupation, an additional department had been opened, and the number of patients set up a fresh record. The demands upon the out-patient, X ray and massage departments, and the dispensary, were far in excess of the accommodation, and the governors, it was stated, were considering plans for the necessary extension. The hospital is staffed by medical women.

LEAGUE FOR SEXUAL REFORM.—The fourth congress of the World League for Sexual Reform on a Scientific Basis will be held at Vienna from Sept. 13th to 20th.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—The annual provincial meeting will be held at Harrogate at 4 P.M. on May 16th, when a discussion will be held on Rheumatism in its Public Health Aspects. In the evening the members will be entertained at dinner by the Mayor and Corporation. Those who intend to be present are asked to notify the Executive Secretary at 1, Upper Montague-street, W.C.1, at once.

NATIVE PRACTITIONER IN DURBAN.—A Natal correspondent informs us that Dr. I. B. Gumede, who has graduated at Birmingham and has returned to practise in South Africa, is the first practitioner that the natives of Natal and Zululand have produced since the death of Dr. Nembula, over 30 years ago. Before coming to England he was educated at the South African Native College at Fort Hare, Cape Province.

A LONDON HOSPITAL SHELTER.—An ornamental shelter erected over the paths in the main quadrangle of the London Hospital, at the charge of Sir William Paulin, was formally inaugurated last week. It consists of teak columns and beams supporting a copper-covered roof, and provides a sheltered way from the wards to the nurses' quarters. The local authorities made it a condition that means must be devised to admit a fire-engine or fire-escape, and the roof is therefore made to open in bascule fashion.

HOSPITAL FIRES.—The central wing of Antrim Mental Hospital (600 patients) has been almost completely destroyed by a fire which began at 10 o'clock at night and is supposed to have been caused by an overheated kitchen flue. Wards nearest to the seat of the fire contained 300 patients, who had to be removed, together with 60 infirm inmates, to safer quarters. The dining hall, recreation hall, and much of the domestic quarters were gutted, and the damage is estimated at £50,000.—A fire, the origin of which has not been ascertained, broke out in the roof of James Murray's Royal Asylum at Perth, and, although it was localised, much damage was done. Most of the patients were in the grounds, and the 26 who were in the building were removed by Dr. W. D. Chambers, the Medical Superintendent, and the nurses before the arrival of the fire brigade.—The Edward Cox Memorial Cottage Hospital, at Meigle, in Perthshire, was almost entirely destroyed on April 15th by a fire which originated in an attic. There were only three patients, who were safely removed; the caretaker's house, kitchen, and laundry alone were saved. The loss, which is estimated at £20,000, would have been much less serious but for the lack of water, over a mile of hose having to be laid across fields and a main road by the Dundee Fire Brigade to tap Meigle Burn.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

REASSEMBLY AFTER EASTER.

BOTH Houses of Parliament reassembled on Tuesday, April 29th, after the Easter recess.

MINISTRY OF HEALTH VOTE.

On Tuesday, April 29th, the House went into Committee of Supply on the Civil Service estimates. Mr. ROBERT YOUNG was in the chair.

On a vote of £12,724,200 for the salaries and expenses of the Ministry of Health, Mr. A. GREENWOOD (Minister of Health) said that the total amount of the estimate was a little over £2,000,000 less than that for last year. The decrease was accounted for primarily by the discontinuance of certain public health grants as from April 1st this year. Administrative charges showed an increase of £190,000. Dealing with the general housing position the right hon. gentleman said that up to March 31st this year there had been completed since the Armistice in connexion with State-aided schemes of housing 939,000 houses. In addition, private building without Government assistance accounted for 520,000 houses, so that since the end of the war the total number of houses completed in England and Wales amounted to 1,459,000. Of the houses built with State assistance, 527,000 were built by local authorities. Slum clearance had proceeded slowly partly because of the present state of the law, and partly because of the legal decision given in the courts some little time ago, reinforced by another decision given quite recently, and the Housing Bill now before Parliament would meet that situation. Since the war the State had expended, up to the end of March this year, £85,000,000 on housing. Referring to the progress of town-planning, Mr. Greenwood said that there were now 80 regional planning committees, 60 of which were advisory and 20 executive. Substantial progress had been made in town-planning in the course of the year At present town-planning schemes were in operation, or proposed, covering in England and Wales at March 31st this year over 5,417,000 acres compared with 4,450,000 acres a year ago. Dealing with the transfer of functions under the new Local Government Act, the right hon. gentleman said that a number of local authorities had straight away appropriated individual institutions for the purposes of the Public Health Acts, and in such cases these institutions would cease to be poor-law institutions and would come under the administration of the committee of the council concerned with the special services for which this scheme was established. But if the council wished to supplement it by the use of other poor-law accommodation it could do so. This process of appropriating institutions, he imagined, would develop in course of time. Forty-eight out of 62 counties and 75 out of 83 county boroughs had preferred to set up an ad hoc committee as a separate public assistance committee. Forty-two county schemes and 52 county borough schemes provided for the inclusion of coöpted members. It was gratifying to know that 16 county councils and 49 county boroughs had found it possible to make an immediate declaration on their schemes that certain poor-law services for which parallel provision had been made under special Acts of Parliament should be treated exclusively under those Acts and not by way of poor-law relief. One hoped that as the new authorities became more familiar with their work the process of taking services out of the poor-law and operating them under separate Acts would be developed. He had given a good deal of thought to the problem of out-relief and came to the conclusion that the Relief Regulation Order of 1911 required very drastic amendment if it was to be brought into any kind of relation with existing industrial conditions. The Relief Regulation Order, 1930, represented a substantial departure from the previous Order. The two principal changes were, first, that institutional relief was no longer to be regarded as the appropriate form of relief for the able-bodied. The second change had been to suggest that the conditions to the grant of relief should not have as their object merely a deterrent to the destitute person, but should be designed to maintain his morale and physique.

Increase in Sickness Claims.

He (Mr. Greenwood) gathered from what had been said in the press that there was a good deal of anxiety in the minds of hon. Members in regard to the increase of sickness claims under the National Health Insurance Act. The problem was, of course, a very serious one and had been occupying the mind of the Ministry of Health for some time. Two years ago the National Health Insurance Joint Committee authorised the Government Actuary to make an investigation into the substantial increase in recent years in claims for sickness and disability benefits. The Report of the Government Actuary was now in the hands of the Committee. In the meantime the department had been doing what it could in consultation with the approved societies to improve the supervision of claims and the selection of cases for reference to the regional medical officers. In 1928 there was a fall in the number of sickness claims from 1927, but in 1929, even after discounting the serious cases of influenza, there was a considerable rise over 1928. This year for the first three months there was an appreciable reduction, due primarily to the milder weather compared with last year, and the absence of an influenza epidemic. It was quite clear that further examination must take place into the problem. Suggestions have been made that there should be a Departmental Committee, but in his view such a committee would not be the proper body to deal with what was essentially a problem of administration. On the receipt of the report of the Government Actuary the National Insurance Joint Committee decided to extend the scope of the investigations and the whole question was now under the close attention of the officers, administrative and medical, of the insurance departments in all parts of the United Kingdom—England, Wales, and Northern Ireland. When their investigations had proceeded sufficiently far the approved societies would be brought into consultation, as would be the Insurance Acts Committee of the British Medical Association, and out of their investigations and deliberations he hoped that they might get some clearer opinion on what lay behind this very large increase in claims for benefit. He was convinced that there was no simple explanation of the increase. Precisely the same problem was arising in other countries which had fairly well-developed schemes of sickness insurance. In Germany, for example, the increase between 1927 and 1929 was 70 per cent. He did not wish to speak

too definitely as to the cause of the increase of claims in this country, but the prolonged trade depression was, he believed, one very important contributory fact. He thought if a person was ill and was not working he would go to the doctor, whereas if he had work he would work longer before going to the doctor. Another factor which seemed important, although it was difficult to assess its value, was that people were to-day seeking medical advice earlier than they used to do. In fact, the public had been urged repeatedly not to delay treatment, but to obtain it at the earliest possible moment. In so far as the increase in sickness claims was due to this it was to be welcomed for it meant in the long run an economy in the funds of the insurance societies. There were cases where owing to laxity of certification or administration persons were in receipt of benefit who were not properly entitled to it. It was clear that it was necessary for some societies to have a more effective sickness visitation and more discrimination of the cases going to medical officers. A new regulation was to be issued shortly which would enable effective disciplinary action to be taken where it was proved beyond doubt that practitioners had failed to exercise reasonable care in the issue of certificates. With a view to getting a more precise knowledge of the situation two separate tests were being conducted now. In the first place an analysis was being made of about 80,000 cases referred to the regional medical officers by a large number of societies throughout the country during 1929. Secondly, with the object of obtaining more precise knowledge as to the standard applied in interpreting the phrase "incapacity for work" an investigation was to be made shortly by officers of the insurance department covering a large number of persons in receipt of benefit on a particular day. By this means it was hoped to bring about a more uniform standard of certification throughout the country.

Mr. Greenwood then proceeded to review the measures being taken to reduce maternal mortality and tuberculosis. A report of the rest of his speech and of the subsequent debate will appear in the next issue of THE LANCET.

HOUSE OF COMMONS.

TUESDAY, APRIL 29TH.

Five-day Week and the Health of Workers.

Mr. KELLY asked the Home Secretary whether, from reports of his inspectors, he had information as to the number of firms working a five-day week; what effect this had on the health of the workers: and whether this method of working had been of advantage to the trades and industries. —Mr. CLYNES replied: I have no exact information as to the extent to which the five-day week has been adopted, but reports show that there has been some increase in the number of firms working this system. The system has not, however, been adopted sufficiently widely to enable the Factory Department to form any reliable opinion as to its effect on the health of the workers. As to whether this method of working has been otherwise of advantage to industry, I can only say that certain firms have made the statement that output has improved as a result of its adoption, and there seems to be no tendency to revert to the old system once the five-day week has been adopted.

CITY OF LONDON MENTAL HOSPITAL.—Last year 221 patients were admitted to this hospital at Stone, near Dartford, in Kent; at the beginning of the year there were 655 inmates; 151 left and 56 died. The demand for private accommodation at a cost varying from £1 8*s.* to £5 5*s.* per week was greater than could be met. The weekly sum charged for the maintenance of rate-aided patients was £1 6*s.* 10*d.*; the average all-round weekly cost was £1 8*s.* 11½*d.*

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—A four weeks' course in dermatology begins at the St. John's Hospital, Leicester-square, on May 5th; it consists of clinical instruction every afternoon and evening, and four lectures a week. Special practical pathology can be arranged. A course of evening lectures in preparation for the M.R.C.P. examination will be held from May 13th to July 4th. It consists mainly of lectures on Tuesdays and Fridays at 8.30 P.M. in the lecture room of the Medical Society of London, Chandos-street, Cavendish-square. Other special courses during May are as follows: diseases of the chest at the Victoria Park Hospital, all day from May 12th to 24th; ophthalmology at the Central London Ophthalmic Hospital, afternoons from May 19th to June 7th; diseases of children at the Hospital for Sick Children, mornings from May 26th to June 7th; and medicine, surgery, and the specialties (with special reference to tuberculosis) at the Queen Mary's Hospital, Stratford, from May 26th to June 7th. Copies of all syllabuses and information on post-graduate work are obtainable from the Fellowship at 1, Wimpole-street, London, W.1.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, May 6th.—5.30 P.M., ORTHOPÆDICS. (Cases at 4.30 P.M.) Annual General Meeting: Cases will be shown.
WEDNESDAY.—5 P.M., HISTORY OF MEDICINE. Annual General Meeting. A paper by the late Mr. M. Ferguson on Alexis of Piedmont and his Secrets will be read. 8.30 P.M., SURGERY. Annual General Meeting.
THURSDAY.—8.30 P.M., NEUROLOGY (Specimens will be shown at 8 P.M.). Annual General Meeting. Dr. L. S. Kubie: Theoretical Application of the Properties of Circus Movements of Some Neurological Problems. This will be followed by a discussion of the pathological exhibits.
FRIDAY.—5.30 P.M., CLINICAL. (Cases at 4.30 P.M.) Annual General Meeting. Cases: Dr. H. V. Morlock: Hæmophilia Treated by Liver Diet. Dr. D. C. Hare: Massive Œdema of One Leg; for Diagnosis. Dr. E. C. Warner: A Case of Grave Hæmolytic Anæmia in a Child Cured by Liver Extract. Other cases will be shown. 9 P.M., GENERAL MEETING OF FELLOWS. Prof. John Murdoch (Brussels) will give a lecture on Radium Treatment of Cancer. The President (Lord Dawson) will take the chair.
SATURDAY and SUNDAY.—BALNEOLOGY and CLIMATOLOGY. Annual Provincial Meeting at Torquay.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos-street, Cavendish-square, W.
THURSDAY, May 8th.—8.30 P.M., General Meeting. Mr. Jocelyn Swan: Paper on Strictures of the Urethra: A Discussion will follow.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, May 5th, to SATURDAY, May 10th.—CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C. All-day course of instruction (Clinical) in diseases of the Ear, Nose, and Throat for three more weeks.—MAUDSLEY HOSPITAL, Denmark Hill, S.E. Course in Psychological Medicine. Clinical Practice of the Hospital and Special Lectures Daily. Proportional Fee for Remaining Three Weeks.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Every afternoon, clinical instruction and lectures on Diseases of the Skin.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, May 5th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose, and Throat Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations. 4.30 P.M.: Dr. J. Brownlie Alexander: Special Lecture on the Treatment of Diabetes.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M. Medical, Surgical, Throat, and Ear Clinics. Operations.
FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M., Medical, Surgical, and Children's Diseases Clinics. Operations.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, May 5th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Ward. 2 P.M., Mr. Sinclair: Surgical Wards.
TUESDAY.—10 A.M., Medical Registrar: Medical Ward. 2 P.M., Mr. Hambleu Thomas: Throat, Nose, and Ear Dept. 2.30 P.M., Sir Henry Simson: Gynæcological Operations.
WEDNESDAY.—10 A.M., Dr. Burnford: Medical Ward. 2.30 P.M., Mr. Donald Armour: Surgical Ward. Dr. Scott Pinchin: Medical Out-patients.
THURSDAY.—11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Department. 2 P.M., Mr. MacDonald: Genito-Urinary Department.
FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M. Mr. Vlasto: Throat, Nose, and Ear Department. 2 P.M., Mr. Sinclair: Operations.
SATURDAY.—9 A.M., Mr. Vlasto: Throat, Nose, and Ear Operations. 9.30 A.M., Dr. Burnford: Bacteriological Therapy Department. 10 A.M., Dr. Owen: Medical Children's Department.
Daily, 10 A.M. to 5 P.M., Medical, Surgical, and Special Out-patients, Operations, Ward Visits, Anæsthetic Courses.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck-street, W.
THURSDAY, May 8th.—6 P.M., Prof. John Murdoch (Brussels): The Problems of Dosage in Radium Therapy.

KING'S COLLEGE, Strand, W.C.
WEDNESDAY, May 7th, and following THURSDAY and FRIDAY.—5 P.M., Prof. J. A. Gunn: Pharmacological Reactions of Involuntary Muscle. (Free lectures.)

UNIVERSITY COLLEGE, Gower-street, W.C.
WEDNESDAY and THURSDAY, May 7th and 8th.—5.30 P.M. Prof. F. J. Cole: The Early History of Generation and Comparative Anatomy. (First and Second of three free lectures.)

ST. MARY'S HOSPITAL INSTITUTE OF PATHOLOGY, W.
THURSDAY, May 8th.—5 P.M., Dr. W. E. Gye: The Action of Antiseptics on the Virus of Filtrable Tumours.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.
TUESDAY, May 6th.—5 P.M., Dr. J. A. Willett: Lessons Learned from Emergency Admissions.

LONDON SCHOOL OF DERMATOLOGY SUMMER COURSE, 49, Leicester-square, W.C.
MONDAY, May 5th.—5 P.M., Dr. S. E. Dore: Animal Parasites.
TUESDAY.—5 P.M., Dr. H. W. Barber: Alopecia Areata and Vitiligo.
THURSDAY.—5 P.M., Dr. A. C. Roxburgh: Differential Diagnosis of Some Common Skin Diseases.
FRIDAY.—5 P.M., Dr. G. B. Dowling: Skin Diseases due to Protein Sensitisation.

GREAT NORTHERN HOSPITALS POST-GRADUATE LECTURES.
WEDNESDAY, May 7th.—3.15 P.M. (at the Royal Chest Hospital, City-road), Dr. James Maxwell: Bronchial Carcinoma.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
TUESDAY, May 6th.—4.15 P.M., Dr. W. Fletcher Shaw: Displacements.
FRIDAY.—4.15 P.M., Dr. E. W. Twining: Radiological Demonstration.

UNIVERSITY OF SHEFFIELD POST-GRADUATE LECTURE.
TUESDAY, May 6th.—8.45 P.M. (in the Physics Department of the University of Sheffield), Dr. J. Murdoch (of Brussels): Radium Therapy in Cancer.

UNIVERSITY OF LEEDS MEDICAL SCHOOL.
WEDNESDAY, May 7th.—3.30 P.M., Dr. J. Murdoch: What Can we Expect from Radium in the Treatment of Cancer?

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, May 7th.—4.15 P.M. (at the Victoria Infirmary), Mr. W. A. Sewell: Surgical Cases.

Appointments.

EVANS, MARY, M.B., Ch.B. Manch., has been appointed Assistant Medical Officer of Health, Ashton-under-Lyne.

M'LACHLAN, A. D., M.B., Ch.B. Glasg., Lecturer on Diseases of the Skin, Anderson College, Glasgow.

MACMILLAN, A., M.B., Ch.B. Glasg., D.P.H., Assistant County Medical Officer of Health, Derby.

STOUPE, NORA E., M.B., Ch.B. Belf., House Surgeon to Tyrone County Hospital.

London Lock Hospital and Home: WILLIAMS, R. L., F.R.C.S., Surgical Registrar to the Male Lock Hospital; SANDES, GLADYS, M.B., B.S. Lond., Surgical Registrar to the Female Lock Hospital; RAWLINGS, E. S., M.R.C.S., L.R.C.P., First House Surgeon to the Male Lock Hospital; FIRTH, J. S., M.B., Ch.B., Second House Surgeon to the Male Lock Hospital; and CLARK, ADAMS, M.B., B.S., Second House Surgeon to the Female Lock Hospital.

Certifying Surgeons under the Factory and Workshop Acts: KING, F., M.B., Ch.B., Leeds (Halifax); and RANKIN, A. H., M.B., Ch.B. Glasg. (Eckington, Derby).

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne District Infirmary.—H.S. At rate of £150.
Bath, Royal United Hospital. H.P. £120.
Belfast, Ulster Hospital for Children and Women.—Hon. Asst. S.
Borneo.—M.O. £750.
Bristol, Blagdon, Nordrach-upon-Mendip Sanatorium.—A.M.O.
Bristol Royal Infirmary.—Hon. Reg. for Ophthalmic Dept.
Central London, Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Res. H.S. At rate of £75.
Chester, County Mental Hospital.—Jun. Asst. M.O. £350.
Derbyshire Royal Infirmary.—Ophth. H.S. and Res. Anæsthetist. £150. Hon. Asst. S. Also Hon. Asst. S. to Ear, Throat, and Nose Dept.
Downpatrick, Down Mental Hospital.—Jun. Asst. M.O. £300.
Elizabeth Garrett Anderson Hospital, Euston-road.—H.P., Obstet. Asst., Three H.S.'s. Each at rate of £50.
Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.
Glasgow Royal Infirmary.—H.P.'s and H.S.'s.
Gloucestershire Royal Infirmary and Eye Institution.—2nd H.S. At rate of £100.
Great Yarmouth General Hospital.—Jun. H.S. At rate of £125.
Halifax Royal Infirmary.—3rd H.S. At rate of £100.
Hammersmith Metropolitan Borough.—Tuberculosis Officer, &c. £750.
Hove, Lady Chichester Hospital.—Jun. H.P. At rate of £50.
Haverstock General and North West London Hospital, Haverstock Hill, N.W.—Cas. M.O. and Cas. Surg. O. Each at rate of £100.
Huddersfield Royal Infirmary.—H.S. At rate of £150.
Hyde, Borough of.—Asst. M.O.H. (Part-time). £300.
India, Cachar District.—M.O. Rs.1200 per month.
Inverness, Northern Infirmary.—H.P. £100.
Jerusalem, St. John Ophthalmic Hospital.—Registrar.
Kingston-upon-Thames, Surrey County Mental Hospital Service.—Jun. Asst. M.O. £350.
Leicester Royal Infirmary.—3rd Res. Anæsthetist. At rate of £250. Also Hon. Surg.
London Jewish Hospital, Stepney Green, E.—Hon Reg. to Ear, Nose and Throat Dept. Also Res. M.O. and Jun. Res. M.O. At rate of £150 and £100 respectively.
London Temperance Hospital, Hampstead-road, N.W.—Cas. O. At rate of £120.
London University, Chair of Physiology.—£1000.
Manchester Royal Children's Hospital, Gartside-street.—Sen. M.O. £300.
Manchester, Withington Hospital and Institution.—Three Asst. M.O.'s. Each £275.
Manor House Hospital, Golders Green, N.W.—H.S. At rate of £200.
Middlesex Hospital, W.—Asst. Surgeon.
Oldham County Borough.—Asst. M.O.H. and Clin. Tub.O. £750.
Plymouth, City and Port of.—Asst. M.O.H. £750.
Preston Institution, Fulwood.—Jun. Res. M.O. At rate of £104
Royal Free Hospital, Gray's Inn-road, W.C.—Asst. Surg. to Ear, Nose and Throat Dept. Also Res. Anæs.
Royal Northern Hospital, Holloway, N.—H.S. at rate of £70.
Salford City.—Asst. M.O. for Maternity and Child Welfare. £600.
Salford Royal Hospital.—H.P., also Cas. H.S. Each at rate of £125.
Sheffield Royal Hospital.—Res. Ophth. H.S. Also Res. Anæsthetist. Each at rate of £80.
Sheffield Royal Infirmary.—Asst. Cas. O. At rate of £80.
South Africa, Kimberley Hospital.—Radiologist and Physician for X Ray, Massage and Electrical Depts. £900.
South Eastern Hospital for Children, Sydenham, S.E.—Asst. and Res. M.O.'s. At rate of £100 and £75 respectively.
Southampton, Royal South Hants and Southampton Hospital.—Asst. H.S. At rate of £140.
Southern Rhodesia Medical Service.—Three Asst. and Relieving Government M.O.'s. £500.
Wakefield, Clayton Hospital.—Two H.S.'s. Each at rate of £200.
Wakefield, Middleton-in Wharfedale Sanatorium.—Res. Asst. M.O. £350.
Walsall General Hospital.—Sen. H.S. At rate of £200.
Warwick, Warwickshire King Edward VII. Memorial Sanatorium, Hertford Hill.—Med. Supt. £800.
West London Hospital, Hammersmith, W.—Hon. Surg.
Weymouth and District General Hospital.—H.S. £180.
Whipps Cross Hospital, Whipps Cross-road, Leytonstone, E.—Anæsthetist. £300.
Willesden General Hospital, N.W.—H.P. £100.
Woolwich and District War Memorial Hospital, Shooters Hill, S.E.—H.S. At rate of £125.
Wolverhampton Royal Hospital.—H.P. At rate of £150.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Okehampton (Devonshire).

Births, Marriages, and Deaths.

BIRTHS.

HEAL.—On April 24th, at Exeter, the wife of Dr. J. C. Heal, of a son.

TUSTIN.—On April 23rd, at Templecombe, Somerset, the wife of Dr. E. Melville Tustin, of a daughter.

MARRIAGES.

BAIN—PEASE.—On April 22nd, 1930, at St. John's Church Bishop Monkton, by The Rt. Rev. The Lord Bishop of Ripon, The Rev. Paul de Labilliere, and The Rev. J. Woods, Cyril William Curtis Bain, *M.C.*, M.B., M.R.C.P., St. Anns, York-place, Harrogate, to Diana Alice, youngest daughter of Lieut.-Col. and Mrs. Pease, Park Hill, Harrow.

BERGH—SLATER.—On April 26th, at St. Michael's Church, Sutton Court, Chiswick, Henry John Walter Bergh, M.R.C.S., L.R.C.P., elder son of Mr. and Mrs. F. R. Bergh, of Chiswick, to Gladys Kate, younger daughter of Mrs. K. E. Slater, also of Chiswick.

MCCURRY—CARMICHAEL.—On April 21st, at St. Peter's Church, Harrogate, by the Vicar, the Rev. J. M. Cunningham, Arthur L. McCurry, M.D., 7, De Montfort-street, Leicester, son of the late Joseph McCurry and Mrs. McCurry, 23, Wellington-park, Belfast, to Kathleen, widow of James Carmichael, Leicester, daughter of the late Elijah Salthouse and Mrs. Park, Kingsmeade, Arnside, Westmoreland.

NEILSON—GLYNN-OUSELEY.—On April 25th, at St. Michael's Church, Chester-square, S.W.1, by the Rev. Canon Mitchell, Dean designate of Lincoln, Drevor Frederick Acton Neilson, F.R.C.S., elder son of Dr. Henry J. Neilson, C.B.E., and Mrs. Neilson, of Inchcape, Woking, to Celia Glynn-Ouseley, younger daughter of Mr. and Mrs. Gore Glynn-Ouseley, of Blakesware, Teddington.

PICKERING—SEWARD.—On April 26th, at St. Benedicts' Church, Cambridge, George White Pickering, M.B., M.R.C.P., of Newcastle-on-Tyne, to Mary Carola Seward, youngest daughter of the Master of Downing College and Mrs. A. C. Seward.

STEWART—CROSS.—On April 19th, at St. Peter's Church, Bournemouth, Major Pat Adam Stewart, R.A.M.C., to Enid Gwendoline Cross, only daughter of Mr. and Mrs. Edgar Cross, The White Lodge, Bournemouth.

DEATHS.

COLT.—On April 23rd, following an operation, Thomas Archer Colt, O.B.E., L.R.C.P., M.R.C.S., of "Trawscoed," St. Edwards-road, Southsea, aged 78.

WILLIAMSON.—On April 24th, after three days' illness, Mildred Beatrice Williamson, Assistant Secretary to the Royal Society of Medicine.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

SHOULD MEDICINE BE A MENDICANT?

A REVIEW OF OUR HOSPITAL SERVICE.

Harveian Lecture delivered at the Harveian Society of London on March 13th

BY ERNEST W. HEY GROVES, F.R.C.S. ENG.,
PROFESSOR OF SURGERY IN THE UNIVERSITY OF BRISTOL.

MORE than 320 years have passed since William Harvey was appointed to be the assistant physician and shortly afterwards to be the full physician in St. Batholomew's Hospital. It was on Oct. 14th, 1609, that he accepted a charge which enjoined him to attend the hospital at least one day a week, to take no gift or reward of any of the poor, and to be answerable to God as a faithful physician. We are tempted to wonder what this great scholar and gentleman would think if he could revisit his old hospital to-day.

What William Harvey would Think.

He would find a great light shining from its roof to attract men's gaze, a great cry for money to pay for the buildings, whilst papers and hoardings proclaim the same desperate need for financial help. We can almost hear him saying: "In God's name what has happened to this England and to my most revered hospital? Are there so many more poor than there used to be—or have the benefactions of the rich been stolen or diverted?" We should have to say that, on the contrary, the poor as they were known in 1600 hardly exist to-day, and that the people of England were never so rich and give more to hospitals than was paid in those days for all the national revenue.

We may now discuss whether it is well that all our great hospitals, even including that venerable, ancient, and dignified institution founded by Rahere, should be forced into the position of a needy mendicant asking for alms.

The provision and organisation of a perfect hospital and a perfect hospital system has come to be the great aim and ideal of everyone interested in medical practice, science, or education. To have a perfect hospital and to be one working unit in this perfect thing is, or ought to be the secret, or acknowledged ambition of every medical student and medical practitioner in the country.

If you would interrupt me by pointing out that only a very small proportion of practitioners can belong to hospital staffs, I would welcome your interruption by saying that no matter how isolated and remote the practitioner is, or how engrossed in general practice, yet he ought always to be in real active touch with some hospital, for his own good and for that of his patients. In fact I would go further, and say that remoteness and busy-ness are the most urgent reasons why the practitioner should be in close touch with a hospital where the organised coöperation of his fellow-workers is prepared to give stimulus and help to the seeker and in return asks for a contribution to knowledge and assistance in carrying on work begun in hospital, in the patient's own home.

I say, then, that to the idealist, the hospital we strive for should be a high and holy thing, the very temple of medical truth where we reverently handle the mysteries which have been taught us and earnestly endeavour to search out the secrets of infinite nature, hoping each one of us to serve humanity faithfully, and of having, perhaps, the greatest of rewards in finding some treasure in the storehouse of truth, which we may hand on to those who come after us, to be incorporated by them into the greatest ritual of our religion, which is the service of suffering and the quest of health.

Appealing to Sentiment.

Have I got you into the mood I wanted about our profession and its highest expression of learning, teaching, of research and alleviation of suffering—the hospital? If so, then I am ready to ask the question which forms the title of this address—should medicine be a mendicant?

The old picturesque beggar has almost disappeared from our streets, because by a peculiar irony, that very phase of our civilisation, which has made begging the cherished hobby of the well-to-do has made it illegal for the professional beggar to ply his trade! Even in Italy where but a few years ago begging seemed to be the most popular of vocations, it has now almost disappeared.

Good government and prosperity, and, above all, natural self-respect, have decreed that begging must go—and gone it is. But personal begging is not so remote in this country nor countries in which it still flourishes, so distant that there is any difficulty in picturing its methods and morals. You are accosted in some quiet street by a slouching figure of a man, who has trailing in his wake a bedraggled woman, clutching in her arms a whining child. In terms it may be of snivelling humility, or it may be of truculent menace, you are invited to contribute to the maintenance of this wandering trio. The mendicant, if he is skilled in his art, suits his tone to his hearer, and pleads that it is for his weary wife and hungry child that he is asking help. They have walked an incredible number of miles, have had nothing to eat for days, and unless the child has costly doctor's care it will not live another day. Our feelings on hearing or trying not to hear this appeal are usually those of instinctive distrust and scepticism, resulting from experience. We feel pretty certain that the man is a lazy ruffian, trading on the pitiful condition of the woman and child that he takes with him, in order to get money by begging rather than by working. But it is so much easier to cut short the unpleasant interview by giving the man the money he asks than to refuse or to investigate—that the money is given and the mendicant is confirmed in his shiftless life. Instinct and reason alike counsel that we should refuse. We know quite well that if no one gave the beggar money he would be forced to work. We know that the money given probably goes in drink, that the baby is hired for the purpose of exciting pity, and in short we know full well that mendicancy is a degraded and a degrading thing. The essential method of begging is to make an appeal to sympathy and sentiment rather than to reason, to press urgency of need, so that there may be no time for inquiry; the usual result of begging is indefinitely to prolong the unhappy conditions which are supposed to be relieved. The great art of successful begging is to extort money from people who do not want to give it, and having done this, to represent the transaction as one of voluntary charity. The whole affair being one dictated by pity and carried out by charity cannot be questioned by reason or scrutinised as if it were a business matter. Having once given your money to the beggar, you have no manner of right to dictate to him how he shall spend it.

Our own British hospital system is dependent upon mendicancy. This applies to the oldest institution and those with the finest tradition for service to the community, and to all the hospitals which are responsible for teaching and research. By a curious misuse of terms these hospitals so dependent upon the bondage of mendicancy are called the voluntary hospitals. At the very outset of our criticism of the mendicant hospital system we must face the claims so often made on its behalf—that it has been a wonderful success—so much so, that we are told that people are actually proud of it. Well, I can only say it does not take much to make some people proud!

Its Amazing Success.

As a matter of hard cash results we must concede that hospital mendicancy has achieved an amazing record. I find on the authority of Burdett that 25 years ago the voluntary hospitals received just under £2,000,000 (£1,985,840 in 1903), but that now the year's income is over 14 millions (£14,006,585 for 1928), more than a sevenfold increase in a quarter of a century! And this at a time when taxation, imperial and local, was never so high, and in the very country where this taxation is higher than anywhere else in the world! It is only because the mendicant method has grown so insidiously that it is tolerated for a moment by sensible people. If anyone will seriously argue that mendicancy is good, then why not extend it to other services of the country? Can we imagine education, the legal service, or civil service being dependent upon haphazard philanthropy and appeals by advertisement?

We might without risking any immediate calamity make the expenses of Ministers and the salaries of Members of Parliament the subject of the voluntary system. The Home Secretary, Chancellor of the Exchequer, the local Member of Parliament, and all the upkeep of the Houses of Parliament would depend for their income on flag days, Parliament Sundays, or upon the wiles of their publicity agents—what an alluring prospect, and yet it is just that we are doing for the hospital service. I venture to say that whereas the hospital is essential for the welfare of the community and could not be dispensed with for a single day, there are many who would view the prospect of being without a Parliament for a few years with the utmost equanimity.

I am not concerned over much for saving the pockets of the people, who pay taxes because they must, and give to charitable appeals because they like. It is obvious that the British public like sentimental appeals, whether by great men and women in high places, by famous people on the wireless, and by the most expert advertisers in the Press or on the hoardings. I feel quite sure that if and when the planet Mars is within easy communication with us, that a charitable appeal will be organised in this country to feed

or to clothe or to doctor the needy Martians, and, of course, the appeal will meet with wonderful success. No! the justification for the mendicant system is not established merely by pointing to the fact that so many millions can be obtained by begging—we have to ask whether the system is efficient at present—is likely to be adequate in the future. Begging for the sick poor may have been the best that could be done in days gone by, but it is manifestly failing to-day to provide what is wanted, and which in other countries is actually being provided by other means.

Increasing Complexity of Hospital Service.

One hundred years ago the hospital problem was a comparatively simple one. The sick poor had to be fed and tended whilst he was ill, he was visited by a doctor and ministered to by a clergyman. It was merely a question of providing enough beds, enough nurses, doctors, and clergy. In fact in those days it was but little more than a money problem. Get the money from the charitable public and spend it on the sick poor, counting all the time on the medical profession to give their services for the good cause. But since that time and almost within the life-time of the present generation, the problem has become much more complicated. Instead of merely tending the sick man, scientific knowledge has proved that it is often possible to cure him, and generally possible to alleviate his sufferings. It has been discovered that the cause of disease can be found out, and sickness often prevented.

A highly complex service of preventive and curative medicine and surgery has taken the place of the merely palliative system of tending the sick man. So that the fact is quite evident that the size and complexity of the hospital problem have so rapidly grown as to be far beyond the competence of any philanthropy, whether we call it voluntary or mendicant, to support.

The poor-law guardians have always had many beds for the sick and infirm, but in recent years they have steadily increased the number of beds and improved the character of their buildings, and have distinguished between the sick poor who required active medical and surgical treatment and those who merely need a shelter and an asylum. In most of our large cities at the present moment there are as many hospital beds provided by the municipal authorities as those under the control of voluntary organisations. Of available beds for the treatment of the sick the voluntary institutions have fallen short by about 50 per cent. of the requirements of the community.

It would not, of course, be a fair representation to say that the voluntary hospitals only do about half the work needed, because in respect to the number of cases treated as in-patients, and in respect of out-patients they are still a long way in advance of the municipal institutions. But the outstanding fact remains that in the mere matter of providing enough hospital beds the voluntary system has failed, so that it can only accomplish one-half of what is wanted.

In regard to the number of beds the challenge and growth of the municipal hospitals is far the gravest indictment of the voluntary system. But it is also manifest that when special scientific discovery has made provision of segregated groups of hospital beds necessary, then the demand for such by the community cannot be met by the voluntary hospitals and the health authority is compelled to provide county or municipal institutions for these purposes. Thus acute specific fevers, and then pulmonary tuberculosis, later surgical tuberculosis and venereal disease have had to be put into special public institutions or provided for by the State. This is merely another instance of the fact that the voluntary system is not equal to meeting the requirements of the community. It cannot do so in the matter of the number of beds, it cannot do so in respect of the requirements of special diseases.

The inadequate provision of beds by the voluntary hospitals is most clearly shown by the very long lists of patients waiting for admission, and the known fact that many of these have to wait months before they are admitted. One provincial hospital alone has 3000 patients on its waiting-list. Some of these are patients suffering from malignant disease for whom delay means a loss of what slender chance they have for cure or alleviation, others are working men, who are thrown out of work during all the waiting period. From an economic point of view much more money is spent in supporting these men whilst out of work than would be needed to pay full maintenance fees for them in hospital for three or four weeks. It would probably be an under statement of the facts if we were to say that at the present moment there are 10,000 people waiting for admission to the voluntary hospitals, and that 5000 of these will suffer in money, health, and prospect of recovery from this delay in the treatment of their case. This outstanding fact, that the voluntary hospital system which was competent to meet the needs of the community 30 years ago is now quite inadequate, is due not to any alteration in the economic situation, or to the increase of the population, or to the greater number of sick people. Actually the income of the voluntary hospitals has by its sevenfold increase far out-stripped the increase in population, cost of living, or morbidity.

Two Fundamental Changes.

There have been two fundamental changes in the relationship between the supply and demand of hospital service which not only account for the failure of the voluntary system, but which make it clear that mendicancy is not only inadequate, but also unsuitable and indecent. These two changes have come about so gradually that their importance has been overlooked.

In the first place medical practice, both in regard to diagnosis and treatment, has become so complex that it requires to be carried out in a scientific institution, provided with apparatus and personnel suitable for scientific work. In other words, a sick or injured person will require a properly equipped institution for his recovery. The second change follows naturally from the first. If the care of the sick and injured requires scientific institutions then this need will be equally great for the rich as for the poor, for the self-supporting as well as for the indigent.

This may be illustrated by two common conditions requiring medical or surgical attention. The first a case of dyspepsia. The patient will require to have his history taken by an experienced practitioner, he will be referred to a biochemist or pathologist to report on the chemical changes of his gastric contents and the presence of occult blood and other changes in the fæces, he must be examined by an expert radiologist to know whether the mobility of the stomach, duodenum, and intestines is normal or abnormal and whether there is any ulcer or growth to be seen; if a removable cause for the dyspepsia is found he will require the services of an anæsthetist, a surgeon, and an assistant surgeon to perform the necessary operation, whilst his after recovery will depend upon the skill of a house surgeon, a sister, and a nurse. So that this one case needs the services of no less than nine specially trained people whose work will be much more satisfactory if they are accustomed to act together as a well-trained team.

The other instance is that of a man run over in the street and suffering from an infected open fracture. His treatment will require the immediate services of a house surgeon, with one or two dressers, the administration of an anæsthetic, the administration of anti-tetanic and anti-gas sera, the examination of his wound secretion by a pathologist, provided with a laboratory and staff of assistants. Later he will want the help of a surgeon for manipulation or splinting of the fracture, and perhaps he will want a bone-grafting operation, which can only be done with the best chance of success by a specialist who has had adequate experience of this work, and who must be able to rely upon the help of a trained assistant and nurses with special knowledge. Again this means the need of eight or nine highly skilled persons accustomed to work together as a team.

Gravity of Illness, not Poverty.

This I believe to be the crux of the whole problem. The raison d'être of the voluntary hospital was the idea of relief of the sick poor. The need of the present hospital system is to provide adequate investigation and treatment of disease for the whole community. It may have been the right and proper thing to accept the rich man's gifts and to supplement these by begging alms to help the sick poor, but by no possible reason can justification be found for making a charity of the application of modern science for the needs of the middle classes or the rich. The total number and relative proportion of the very poor people is much less than it was, but the need for hospital beds is much greater. This is not because people with money wish to become the objects of charity, but because any man, whatever his means, knows quite well, and his doctor tells him that if he is seriously ill he must enter a hospital, so that he shall have the full investigation, nursing, and treatment that can only be provided in a scientific institution. This cardinal fact, that the gravity of the illness or the danger of the injury which the patient suffers and not his poverty constitutes the chief claim he has to admission to a hospital is shown in various ways. The police and the street ambulance take every serious case of accident straight to the nearest hospital.

In some places, if the patient is a well-to-do man, he is kept for treatment, and a suitable donation to the charity is expected of him, in others he is transferred to a private nursing home as soon as possible. In a very few he is put into a private ward and pays his way, both to hospital and to medical staff. If a man injured in a street motor accident is taken to a nursing home then the expenses of his stay there and all fees for medical attendance become a claim against some insurance company, which is met, generally, without demur. But if the same man is taken to a hospital and receives the same attention, there is no claim either for

maintenance, nursing, or surgical attendance, because the patient is the recipient of charity!

The managers of most voluntary hospitals, partly driven by necessity to raise funds and partly because they know that most of the patients are by no means destitute, have instituted a charge to all their patients of about £1 a week, which is modified or remitted if the patient cannot pay. The voluntary system has indeed changed its character in attempting to carry out a task for which it was never intended, and for which it is quite unfitted. Only a certain portion of the funds can now be described as the product of free-will—the rest is literally extorted from a reluctant and over-taxed population. Most of the patients have to pay a contribution towards their maintenance, and an increasingly large number have their entire maintenance provided by a contributory insurance scheme.

In fact the only element of the original "voluntary" plan which remains in its pristine beauty is that the visiting medical staff still give their services for nothing! As a matter of fact in the old days it was not considered beneath the dignity of the physician to receive a salary for his hospital appointment. Harvey himself accepted £33 6*s.* 8*d.* a year for one day's attendance per week. The sum named would be the equivalent of about £100 of our money, and thus visiting members of a hospital staff should, if this old tradition had been maintained, receive about £400 or £500 for attendance on four or five days a week at a hospital.

One of the stock arguments against the municipalisation of hospitals is that this would involve paying the doctors. In the recent report of the Royal Commission, inquiring into the working of the National Health Insurance Act, this very point is discussed. This Act produces each year a large surplus, and it would seem obvious that this might be used to pay hospital charges of insured persons who need institutional treatment. But if this were done then the doctors who now work for nothing would expect to be paid—and that, of course, would be a waste of public money which no Royal Commission could possibly contemplate!

So that we are faced with this rather startling position—that there is an available fund for paying for patients in hospital, but that to pay this money for such a purpose would not be prudent because then public admission would have to be made that most hospital patients are not destitute poor, but the well-cared-for children of a wealthy State, and in addition to their maintenance in hospital, further funds would have to be found to pay the men who are doing the healing work. Why on such lines hospitals might even become self-supporting, and then what would become of the "voluntary system"? Large sums of money would be scandalously wasted in paying a profession that now works without payment, and the poor over-worked publicity agents who organise hospital appeals would be thrown out of their job!

Exploitation of the Medical Profession.

This is a definite part of the mendicant system. It has grown up so gradually that it has hardly been noticed. It has been accompanied by so much unctuous flattery of the profession that very few have cared to raise a protest which would bring in no cash but might rob us of the glamour attaching to noble and disinterested philanthropists. Little more than a generation ago the position of the visiting staff of a hospital entailed but little work and responsibility. A visit to the hospital twice a week involving one or two hours, administering to destitute recipients of charity. Now I suppose it would not be an exaggeration to say that to-day the best type of hospital physician or surgeon spends quite half his working time at the hospital, and frequently is called there at night. He is actually applying the modern discoveries of science to the investigation and treatment of disease, and to the mitigation of those accidents of industrial life and modern travel which the use of machinery has caused. He is doing this for the working men and for their wives and children—for those who form the bulk of the most prosperous nation in Europe. And he is still expected to do this responsible work without any direct fee or reward.

But I should be digressing from my subject if I allowed myself to linger on this topic; the last thing in the world I would wish to do would be to make an ad misericordium appeal for the indigent consultant—although it would not be difficult to prove that this man is often denied the fair pecuniary reward of his work, such as is accorded to a man of like ability and independence who devotes himself to business pursuits. But it is necessary to point out how this demand that the consultant class should do so much of the essential work of the hospitals gratuitously does act against the best interests of the hospital service itself. It does so by seriously limiting the choice of the best men for the most important work in the medical service of the country. It makes it most difficult for any medical man or woman to aspire to a position of a hospital consultant, unless he or she is possessed of private means. If he has not got money or cannot marry money, then if he would come on a hospital staff he must for years enslave himself by various methods of making money, such as coaching students, taking various small paid appointments, or ingratiating himself with any general practitioner who is likely to give him private work. All this means that just when he is at his best he must be absorbed in the great problem of making a competency and he cannot devote himself to what ought to be his chief occupation of scientific pursuit. It is only natural, then, that after 10 or 15 years of struggle for existence, when he at last finds himself fairly affluent, he should have lost the zest for research or discovery, and be content to reap the harvest of his toil. We have then the explanation of the general spirit of laissez-faire, which possesses most of our hospital staffs. The younger men are engaged in the grim struggle for maintenance, and the older men are enjoying the fruits of prosperity; so that the former cannot and the latter do not want to disturb the existing state of things.

(*To be continued.*)

ROCKEFELLER MEDICAL FELLOWSHIPS.

FELLOWSHIPS for the academic year 1930–1931 will shortly be awarded by the Medical Research Council, and applications should be lodged with the Council not later than June 1st, 1930. The Fellowships are provided from a fund with which the Council have been entrusted by the Rockefeller Foundation. They are awarded by the Council to graduates who have had some training in research work in the primary sciences of medicine or in clinical medicine or surgery, and are likely to profit by a period of work at a university or other chosen centre in the United States before taking up positions for higher teaching or research in the British Isles. In special circumstances they may be tenable at centres of research not in America. A Fellowship held in America will have the value of not less than £350 a year for a single Fellow, with extra allowance for one who is married. Travelling expenses and some other allowances will be paid in addition. Full particulars and forms of application are obtainable from the Secretary, Medical Research Council, 38, Old Queen-street, London, S.W. 1.

THE ESSEX COUNTY SANATORIUM.

ON Saturday last, April 26th, Mr. Greenwood, Minister of Health, opened the County Sanatorium of Essex at Black Notley, a mile or two south of Braintree, in the presence of a distinguished gathering which included the High Sheriff, the chairman of the county council, and the deputy lieutenants of the county. The original county scheme for the treatment of tuberculosis, framed in 1912, provided for beds in various existing hospitals and private sanatoria. Later on the council built its own sanatoria at Harold Court for men, at Black Notley for women, at Sible Hedingham for children, and at High Beech for surgical tuberculosis. Shortly before the war it was decided to establish a large sanatorium and a site at Sandon was purchased for the purpose but ultimately relinquished. Finally an additional plot of land, 25 acres in extent, was acquired adjoining the existing sanatorium at Black Notley, and Welwyn Builders, Limited, began their work in July, 1928. The lay-out is of the familiar extended façade with south-easterly aspect, the centre of the scheme being the King Edward VII. Memorial Hall, which provides a place of recreation, with seating accommodation for nearly 200 persons. On the right are the two children's pulmonary pavilions with 25 beds each for boys and girls, and on the left two adult pulmonary pavilions each with 25 beds. All the buildings are of light construction, the walls of hollow brick slabs built on reinforced concrete raft, roofed with double Roman tiles, and with wide verandas, which in the case of the pulmonary pavilions have glazed skylights. Two surgical pavilions for 31 patients each occupy the northern portion of the site and are connected by corridors with the operating block, which contains theatre, anæsthetic, sterilising and plaster rooms with sections for X ray and light treatment. There is also an isolation pavilion with six single-bed wards. The school block consists of two large classrooms, the south walls formed by large folding doors admitting a maximum of light and air. The water-supply is from a deep well on the site, from which water is pumped to a tower. There is a dual system of drainage, surface water being discharged into adjacent streams, and the excreta being carried to two filter beds with revolving sprinklers, the effluent being irrigated over the land. Four tennis courts, two grass and two hard, have been laid down. There is a large garden and an area planted with fruit trees. The work was carried out from the designs of the county architect, Mr. John Stuart, F.R.I.B.A., at a total cost, including the site, buildings, services, and equipment, of £100,800.

Goulstonian Lectures

ENTITLED

THE SIGNIFICANCE TO CLINICAL MEDICINE OF STUDIES IN CALCIUM AND PHOSPHORUS METABOLISM.

The Third Goulstonian Lecture in 1930, delivered before the Royal College of Physicians of London on March 18th

BY DONALD HUNTER, M.D. LOND.,

FELLOW OF THE COLLEGE; ASSISTANT PHYSICIAN TO THE LONDON HOSPITAL.

MR. PRESIDENT, FELLOWS, AND GENTLEMEN,—In the first two lectures I referred to those factors which brought about an increased output of calcium and phosphorus from the bones. I shall now speak of certain conditions associated with defective absorption and utilisation of calcium and phosphorus which give rise to diseases of bone. I shall also discuss the storage of lead in the bones in chronic lead poisoning, and I shall conclude by stating briefly the contributions to therapeutics of the researches I have quoted.

IRRADIATED ERGOSTEROL.

Studies of calcium absorption and utilisation are necessarily more difficult than those of endogenous calcium metabolism. It is not surprising, therefore, that the voluminous literature on the subject of irradiated ergosterol throws little light upon its mode of action. Various workers [91] [92] have reported hypercalcæmia arising from its use. But the level of the serum calcium indicates only the height of the "calcium stream" and gives no indication of its direction of flow. This can be determined only by studies of the total calcium metabolism.

The effect of irradiated ergosterol on the storage of calcium in animals has been studied by Bauer and Marble.[93] They placed 12 cats on a low calcium diet for some months, previous experiments having shown that such treatment causes a marked diminution of bone trabeculæ. At the end of this period, the left forelegs of all the cats were amputated at the shoulder-joint. All 12 cats were then placed on a high calcium diet, 6 of the 12 being given irradiated ergosterol in addition. After some time the cats were killed, and in each case the right humerus was prepared for comparison with the left. The cats receiving irradiated ergosterol showed a much greater increase in the number of trabeculæ in the right humerus than did the controls.

It therefore seems likely that irradiated ergosterol increases the amount of calcium which is absorbed from the gastro-intestinal tract, and that if this increased absorption occurs at a time when the body needs calcium, an increased deposition of calcium occurs in the bones. Complete metabolism studies on human subjects [93] show that there is an increase in calcium absorption when irradiated ergosterol is administered. These findings corroborate those obtained with cats and explain why the use of irradiated ergosterol in the treatment of rickets and osteomalacia has met with such uniformly beneficial results.

Effects of Over-dosage by Irradiated Ergosterol.

Considerable interest has recently centred on the effects produced by the administration of excessive doses of irradiated ergosterol. Pfannenstiel [94] found that such doses resulted in the death of young rabbits. Kreitmair and Moll [95] extended this work and found that mice, rats, cats, rabbits, dogs, and guinea-pigs died in periods ranging from 15 to 40 days with doses varying from 1 to 40 mg. daily. In all cases the animals lost weight profoundly, and post-mortem examination showed deposits of calcium salts in the arteries, lungs, kidneys, stomach, and intercostal muscles. Kreitmair and Hintzelmann [96] have since confirmed this, and they have added the important observation that, when the experiments are of long duration, there is a decalcification of the bones which especially affects the ribs but also involves the extremities, spine, and calvaria. This mobilisation of calcium from the bones in "hypervitaminosis D" has been confirmed,[97] and György [98] has recorded experiments which seem to show that the spongiosa of bone is called upon first. In these experiments growing rats on a diet not very rich in calcium were treated with large doses of irradiated ergosterol. Hypercalcæmia occurred, and they lost appetite, weight, and hair. Post-mortem examination revealed macroscopic areas of calcification in the aorta and stones in the bladder. Controlled radiograms of the bones showed localised osteoporosis of the subepiphyseal spongiosa.

The Method of Irradiation of Ergosterol.

The work of Dixon and Hoyle [99] has shown that the pathological changes produced in such experiments on animals depend largely upon the manner in which the ergosterol is irradiated. In the case of material irradiated in oily solution—analogous to the natural irradiation of the ergosterol of the skin by sunlight—no abnormal effects upon the weight curve and no post-mortem lesions were found in rats after the daily administration of doses up to 2 mg. for 45 days. Much larger doses administered daily for a corresponding period led to interference with growth and the formation of calcium phosphate calculi in the urinary tract. Calcium deposits in the kidneys, arteries, and other tissues were not present in these animals. The possible significance of these observations is not without interest in the ætiology of tropical urolithiasis.

The pathological effects produced in animals by administering similar doses of ergosterol irradiated in alcoholic solution are very much more severe than those described for material irradiated in oil. They consist essentially of intense marasmus and widespread calcification of the arterial system, myocardium, and kidney. Urinary calculi occur only rarely. Hoyle [100] has shown that the diet given in such experiments is a determining factor in the production of this pathological picture. All the lesions occur constantly in rats when a synthetic diet is being taken together with a daily dose of about 80,000 antirachitic units of irradiated ergosterol, and death is usual within two or three weeks. If a natural diet of bread and milk is given, together with these excessive amounts of ergosterol irradiated in alcohol, the animals remain well, except for some retardation of growth. After 30 or 40 days, post-mortem examination in such animals shows urinary calculi in some cases but no calcium deposits in any of the organs. These latter effects are identical with those produced by giving similar doses of ergosterol irradiated in oil, together with a synthetic diet. In other words, the effect of a natural diet is to deprive ergosterol irradiated in alcoholic solution of certain toxic properties. This is strong evidence against the view that vitamin D and the toxic factor responsible for the marasmus and calcification of tissues are identical, and it shows that "hypervitaminosis," as distinct from the toxic action, is not an entirely new type of toxæmia but only the exaggeration of a physiological action.

In recent work, Hoyle [101] has extended these observations and has found that neither milk nor bread alone, when given with a synthetic diet, has any protective action. Further, a synthetic diet modified to resemble bread and milk as regards its carbohydrate, fat and ash content does not prevent the toxic action of ergosterol irradiated in alcoholic

solution. If the amount of the latter in a diet be increased still more, to such doses as 200,000 units daily, then bread and milk loses its protective effect. These results suggest that some previously unrecognised factor in diet is concerned in the protective action.

RICKETS AND OSTEOMALACIA.

Morbid anatomists are agreed that in rickets and osteomalacia the essential abnormality is the same—namely, a deficient calcification of osteoid tissue. This deficiency is generalised throughout the skeleton. In rickets, since endochondral ossification has not ceased, the zone of provisional calcification is affected too, and endochondral ossification is irregular.

The nature of the calcium deficiency has given rise to much controversy. Virchow [102] held the view that calcium salts had been removed from calcified bone leaving osteoid tissue. This was the doctrine of "halisteresis," which means literally "salt deprivation." Pommer [103] and Schmorl,[104] while expressing the view that osteomalacia and rickets are essentially the same disease, held in addition that halisteresis is not responsible for the broad osteoid zones. They considered that, in both diseases, the calcifying mechanism which should convert osteoid tissue into true bone was deficient. Not only does any bone added by advancing endochondral ossification remain osteoid, but so also does all new bone added to trabeculæ which were fully calcified at the onset of the disease. The normal physiological resorption accompanies this apposition, and consequently portions previously hard become ever softer and more liable to bend.

Now, although there are many problems still unsolved concerning the ætiology of these two diseases, it is clear that the calcifying substance which is missing is vitamin D. In its absence the utilisation of calcium and phosphorus is impaired. Studies of the blood chemistry in children with rickets show that the essential abnormality is a low inorganic phosphorus content. The serum calcium is usually normal, but in a small proportion of cases it is reduced. In such cases tetany may occur. In osteomalacia a low serum calcium is the rule and tetany is very common.

In both diseases the abnormalities in the blood are promptly restored to normal by the use of cod-liver oil, ultra-violet light, or irradiated ergosterol. At the same time ossification begins to proceed normally. Biochemistry has therefore amply justified the view held by Pommer and Schmorl as to the pathogenesis of these diseases and as to their essential identity.

Clinical Features of Osteomalacia.

Osteomalacia is a deficiency disease endemic over wide areas in Northern India,[105] Japan, and Northern China,[106] and occurring sporadically in the Rhine Valley, Danube Valley, Vienna, and certain parts of Italy, Switzerland, Flanders, and the Balkans. It is a rare disease in the British Isles and U.S.A. It pre-eminently affects women, and is likely to recur earlier and with greater severity in each successive pregnancy. Many cases clear up after lactation is complete, or even before this time. However, it is a mistake to suppose that pregnancy is essential in its ætiology; it is sometimes seen at puberty, and is quite well known to occur, though it is rare, in boys and men. Maxwell [106] states that it is known to the Chinese as "Yao t'ui t'eng"—"back and thigh pain." The pain is aching in character and is worse in the winter months. The pelvis, thorax, or long bones show deformity in a haphazard way; one woman suffers in the pelvis, another in the ribs, and a third in both. Besides the characteristic and well-known changes in the pelvis, marked deformities occur in the chest and spine. Severe kypho-scoliosis may reduce the height by several inches and cause the head and neck to sink downwards and forwards on to the chest. Deformities of the sternum and ribs may give rise to marked prominences and depressions in the chest wall. Coxa vara and irregular curves in the long bones are less common. The bones are soft and flexible rather than fragile, so that bending is much more common than spontaneous fracture, though both are well recognised. The patient develops a characteristic waddling gait, and muscular weakness may add to her incapacity. Tetany is very common, and the attacks may last for hours. In many cases the pelvic deformities interfere with marital relations or with pregnancy, Cæsarean section frequently being necessary.

Pathogenesis of Osteomalacia.

It is only in the past seven years that real progress has been made towards solving the problem of the ætiology of osteomalacia. For almost half a century the hypothesis was held that the disease was due to a pathological increase in the activity of the ovaries leading to hyperæmia of the bones and a consequent solution of their lime salts. This was not based on accurate experiment, neither was there any evidence worth the name that the ovaries were histologically abnormal. The hypothesis arose in 1879 when Fochier [103] performed Cæsarean hysterectomy in several cases of osteomalacia and found that a good effect was produced on the progress of the disease. Fehling [109] then set the fashion by performing ovariotomy for osteomalacia quite apart from pregnancy, and within a few years this treatment was performed all over the world. Now, while there can be no doubt that pregnancy leads to the development of osteomalacia, there is very little evidence that the ovaries exert any effect on the disease apart from their rôle in pregnancy. It is true that Mirvish and Bosman [110] have shown that the injection of ovarian extracts into normal human subjects causes a reduction in serum calcium. On the other hand, the experiments of Korenchevsky [111] failed to show after castration any chemical or histological changes in the skeletons of growing rats fed on a normal diet. Castration presumably acts by stopping the possibility of further pregnancy and lactation with their consequent drain on skeletal calcium, and this can be as easily done by ligature of the Fallopian tubes.

An amazing fallacy regarding the ætiology of osteomalacia originated in the work of Bossi,[112] who arrived at a method for treating the disease with adrenalin by the following argument: "Since suprarenal substance is known through its pressor action to modify deeply the circulation of both sexual organs and bone marrow, since removal of the suprarenal has been shown in animals to cause deep and lasting change in the ovary, I thought of treating this case with suprarenal substance (adrenalin)." After claiming on quite inadequate evidence, that the patient was cured by the injections, he proceeded to an experiment upon a sheep in the middle of pregnancy. He removed one suprarenal and the animal remained well until the seventh day, when it had difficulty in walking. On the eighth day it could neither stand nor walk, and it showed "curvatures of the joints in the whole body, the hips markedly rotated inward and painful on pressure." Such is the evidence on which the suprarenal origin of osteomalacia is based. One asks oneself whether its exponents of to-day have troubled to read the article from which it sprang!

Studies in the mineral metabolism of osteomalacia date back many years, and began with analyses of the bones. McCrudden [113] in a case of adolescent osteomalacia found 15·4 per cent. CaO in dried bone as compared to 28·8 per cent. in normal bone. In 1910 the same observer demonstrated a negative calcium balance in eight cases of osteomalacia.

The blood chemistry had not been studied accurately until Miles and Feng [114] investigated ten patients in May, 1923. These cases varied in duration from 8 months to 20 years; in 7 there was tetany and in all a considerable diminution in the serum calcium (5·0 to 7·4 mg. per 100 c.cm.). The plasma phosphorus varied from 1·8 to 3·8 mg. per 100 c.cm. The same workers carried out calcium

balance experiments on four adult females taking a low calcium diet consisting of millet gruel, wheat bread rolls, celery-cabbage, garlic, and dry steamed millet. A negative calcium balance was found in three patients, positive in one. Keeping the diet identical and adding cod-liver oil, alone or in combination with either calcium lactate or calcium phosphate, they were able to bring about marked retention. In one patient receiving olive oil with calcium lactate, the calcium balance remained negative. Osteomalacia therefore chemically resembles low calcium rickets. In the present state of our knowledge the occurrence of hyperplasia of the parathyroids in osteomalacia [64 65] is without explanation. Since all the parathyroids are usually affected, the hypothesis that the change is compensatory seems attractive.

Economic Factors Responsible for Osteomalacia.

With the story of rickets before us we can trace the economic factors operating in the causation of osteomalacia. They are factors difficult for a Western civilisation to appreciate, deep-rooted as they are in the social and religious customs of the East. The diet of the Chinese people is meagre, consisting, as in the experimental diet used by Miles and Feng, entirely of cereals and a limited amount of vegetables with no milk, meat, or eggs. It is deficient in vitamin D and in calcium salts, and contains an excess of acid-forming over base-forming mineral elements. The environment tends to keep the woman patient isolated from the sun, for foot binding retards movement, and the severe winters of the high plateau lands of North China lead to confinement indoors. When the pains of osteomalacia begin she retires to her warm brick bed thereby completely shutting herself off from the sun. In India the areas affected are in the North, in the high valleys where sunlight is scanty in winter owing to the surrounding mountains. As in China there is a marked seasonal incidence, the disease being worse in winter and early spring. The women affected are those observing strict purdah.[115] They are systematically screened from the sun from the age of ten. They eat no raw vegetable or fruit, largely from fear of cholera. The pregnant woman is kept short of food with the idea of keeping the fœtus small for an easy labour. The calcium drain of lactation is very severe, for it commonly goes on as long as four years. Under such social systems it is not surprising that other deficiency diseases may exist together with osteomalacia. Thus Wampler [116] reports œdema in one-third of 46 cases, and xerophthalmia in one.

In the treatment of osteomalacia, as in the case of rickets, cod-liver oil, sunlight, and irradiated ergosterol, each has its place. Vaughan [115] reports that "out-patients given cod-liver oil and ordered to go out on the lake in open boats improved rapidly." Staringer [117] and Hottinger [118] report cures with irradiated ergosterol, and it is an interesting fact that each of their cases had been previously treated unsuccessfully by ovariotomy. Maxwell [106] states that "given cod-liver oil, good food and sunlight, the majority of the patients will slowly recover. Cod-liver oil and calcium salts quickly remove tetany and the worst of the pain." He finds that some cases require an ounce and a half of cod-liver oil with one milligramme of irradiated ergosterol daily. But he adds, "we want flocks and herds, milk and meat, with security of life and property."

Antenatal Rickets.

In the days of Virchow, several diseases of bone discoverable in the new-born were classed together as "fœtal rickets." These have since been identified as achondroplasia, osteogenesis imperfecta, and retinism. Maxwell [106] claims to have found true rickets in antenatal life. He took radiograms of the bones of the new-born babies of osteomalacic mothers, and demonstrated the typical changes of rickets in the metaphyses. Microscopic preparations of the bones were obtained from one case. In these, Turnbull [107] found changes attributable to a mixture of rickets or osteomalacia, with Barlow's disease. It is of some importance, too, that babies of osteomalacic mothers do get post-natal rickets, and that in China rickets is especially severe where osteomalacia is more common.

Hunger Osteopathy.

Occasional cases of hunger osteopathy were known [119] before 1914, but the mass experiment of war caused large numbers of cases to appear in Austria, Germany, and Poland between 1917 and 1919. Concurrently rickets,[120] late rickets, osteomalacia,[121] and Paget's disease,[122] increased in incidence and severity. The people of industrial towns were most affected. Thus in Frankfort the food was principally potatoes, watery soups, and dried carrots. Fresh vegetables were rarely obtainable. Meat, fish, and bread were rationed. Fat, butter, cheese, eggs, milk, and rice were completely absent. Hence the diet was deficient not only in total calories, protein, and fat, but also in calcium, phosphorus, and vitamins.

Clinically, the condition resembled early and slowly progressing osteomalacia. In age and sex incidence it was most peculiar. The majority of patients were elderly, and of either sex. Adolescents between 14 and 20 years were also attacked, and in this age-period two to four times as many males were affected as females. Children from 6 to 14 years were absolutely spared, and people from 20 to 35 years were almost wholly immune. The poorest were most affected. They looked prematurely aged, with sunken orbits and a sallow colour. Pain in the tarsus and metatarsus gave rise to difficulty in walking. Later there was pain in the sacrum and ribs, with a characteristic waddling gait and difficulty in mounting steps. The pains were always associated with movement. Many patients complained of cramp in feet, legs, or forearms. Tetany was not infrequent, and some cases showed positive Erb, Trousseau,[120] and Chvostek signs.[123] There was tenderness of the bones, so that compression of the ribs and sacrum and abduction of the thigh caused pain. A few patients gave a definite history of decrease in height. Spontaneous fractures were sometimes seen,[124] and occasionally deformities of ribs, sternum, and spine.[119 123]

Dalyell and Chick [120] found a marked remission in the disease in Vienna in the late summer of 1919. In December, 1919, they found fresh and recurrent cases in two convents in which the nuns had suffered severely during the previous winter. Between January and May, 1920, they treated 600 out-patients with the disease. For obvious reasons no investigations of the blood chemistry could be made. Cod-liver oil was found to be a specific. After a few days movements of the trunk became less painful, so that the patient could stoop or turn readily. The gait often improved within a week. During the second week there was less pain on abduction of the hip, but pain caused by compression of the ribs continued longer. The most obstinate pains were the lumbo-sacral and tarsal, which sometimes persisted for six weeks after the commencement of treatment. In cases with tetany this improved before the other symptoms and signs. From what we now know of vitamin D, the remission of symptoms in summer and their relapse in winter was a question of the amount of sunlight; and from accounts of the disease it is evident that no therapeutic measure was successful unless it included vitamin D. Post-mortem material was only obtained where deaths occurred from intercurrent disease. There has been much controversy as to whether the condition was true osteomalacia, and this, of course, can only be settled by the expert histologist.

Schmorl [125] and Partsch,[119] working in Dresden, regard the condition as true osteomalacia showing an extreme degree of osteoporosis. They comment upon the rarefaction of the corticalis; in one case "the compacta of the femur was nowhere more than 3 mm. thick." In the vertebræ the corticalis was

almost as thin as paper, and the spongiosa could be crushed with the finger. The histological picture showed the spicules of the spongiosa much reduced in number and in thickness, and composed of narrow cores of bone covered by broad seams of osteoid tissue.

Goldschmid,[126] working in Frankfort, states that "purely porotic changes predominate in the bones, though there are quite isolated cases where thin spicules covered with narrow osteoid seams are found in the spongiosa—that is a combination of porosis with malacia." The student of mineral metabolism would predict such disagreement between histologists since so many factors, varying in different localities, came into play. These variables were degree and length of starvation, amount of calcium, phosphorus, and vitamin D in the diet, and exposure to sunlight. It is interesting that Schmorl[125] should have found enlargement of the parathyroids in a man of 73 who had suffered from hunger osteomalacia with pains in the bones for three months. He states that "there was a very great enlargement of the parathyroids, the two upper ones being the size of a cherry stone, and one lower one the size of a pea. The fourth was not found."

Styfsiekte, or Stiff-Sickness of Cattle.

Styfsiekte, or "stiff-sickness," is a phosphorus deficiency disease of South African cattle. The problem of its ætiology has been solved by the extensive investigations of Sir Arnold Theiler.[127] The disease also occurs in Minnesota,[128] and is probably identical with the "Grand Traverse Disease" of Michigan, "Impaction Paralysis" and the "Cripples" of Australia, and "Midland Disease" of Tasmania.[129] The animals most affected are heifers with a first calf, cows in lactation, and growing cattle. They may develop an intense craving for bones, a symptom which is termed osteophagia. This compels them to travel long distances to find carcasses to eat, and they may even kill and eat young lambs. On the veld they may sometimes be seen and heard in the distance crunching bones. The disease shows itself in retardation of growth and abnormal skeletal development, the most obvious features of which are the thickening of the epiphyses of the leg bones, most pronounced at the metacarpus and first phalangeal joints. The gait is stiff and lame. In the young lactating animal there is usually rapid loss of condition, the lameness may become acute, and the animal tends to walk on its heels, with hoofs growing out. The bones may become fragile, and fracture of the ribs and pelvis has been observed. The posture becomes abnormal, sometimes with curved spine, and in the last stages the stiffness and lameness become so painful that the animal is unable to rise, so that death from cachexia ensues. In the affected areas the soil and grass are deficient in phosphorus, so that hay may contain less than one-fifth the normal amount of phosphorus. The blood chemistry has been investigated in the Minnesota cases.[128] There the low phosphorus intake gives rise to a low inorganic phosphorus content of the plasma, which is often less than 2 mg. per 100 c.cm. There is no defect, however, in the calcium content of the fodder, and the serum calcium of affected cattle is normal or even raised (12·1 to 14·6 mg. per 100 c.cm.). The bones are fragile and easily cut with a knife, and the skeleton is light.

Theiler, Green, and du Toit[127] have reproduced experimentally "aphosphorosis," or clinically recognisable phosphorus deficiency disease, and have shown it to be identical with the naturally occurring South African disease Styfsiekte. The animals were heifers varying in age from 12 to 18 months. All of them received exercise each day in brilliant sunshine. The disease picture was produced in all animals where low-phosphorus rations were given, whether the calcium content of such rations was high or low. The inorganic phosphorus of the blood sometimes dropped to 1·3 mg. per 100 c.cm., even before the disease could be diagnosed clinically; the blood calcium was normal. Vitamin deficiency of the diets had no adverse effect.

Of the affected animals dying or killed some showed brittle, fragile, or fractured ribs, the whole of the skeleton being too light. Sir Arnold Theiler is at present working on the histology of experimental aphosphorosis, and he states[130] that "the sections reveal the presence of osteomalacia and rickets in some cases in a most extraordinary degree." Although his work is not yet published, he was kind enough to lend me stained sections of bones from his experimental material together with controls. Prof. Turnbull studied these sections, and he agrees that the abnormalities are typical of rickets, or of osteomalacia in bones in which endochondral ossification has not ceased.

Styfsiekte is therefore rickets or osteomalacia of the "low phosphorus" type, produced by a mass experiment of Nature in areas where the soil and grass are deficient in phosphorus. Sunlight is apparently unable to prevent its occurrence. As further evidence that the condition is one of pure phosphorus deficiency, the South African workers found that the disease can be prevented by supplementing the grazing of the areas in which it is prevalent with bran, which is a food of high phosphorus, low calcium content. Similarly, the Minnesota workers, by a supplementary ration of 100 g. daily of NaH_2PO_4, were able to raise the plasma phosphorus to 5·5 mg. per 100 c.cm. with complete clinical cure.

The routine preventive is bone meal. The ration required varies from half a pound to two pounds per head per week, according to conditions of growth and lactation. This simple measure abolishes osteophagia and Styfsiekte, and leads to an increase of the milk yield of cows, better calves at birth, more rapid growth of young stock, and superior fattening of adult cattle. Could agriculture ask more of the scientific investigator?

Late Rickets.

Late rickets is found in the later years of childhood in places where rickets is common. It is also found where osteomalacia is endemic. Its pathogenesis, blood chemistry, and histology enable us to class it definitely with rickets and osteomalacia. With a knowledge of vitamin D, and especially of the newer methods of blood chemistry, two conditions associated with bone deformities have been differentiated from late rickets—namely, cœliac rickets and renal rickets. It should be clearly understood that cases of cœliac disease and renal infantilism only occasionally show rickets; in fact, cœliac rickets is quite rare in cœliac disease.

Although these two conditions show clinical pictures quite different from rickets, the actual bone changes may be identical with that disease. For example, in a case of renal rickets examined by Prof. Turnbull, histological sections of the bones were in all respects characteristic of rickets. This point is of paramount interest in the study of calcium and phosphorus metabolism, for in renal rickets vitamin D is not lacking, and the bone changes are due to a disturbance of endogenous and not of exogenous metabolism.

Cœliac Rickets.

Cœliac infantilism may be defined as the arrest of development which occurs in that form of severe chronic intestinal indigestion described by Gee,[131] and explained on the basis of defective fat absorption. In 1913, Parsons[132] pointed out that bone deformities, especially genu valgum, not uncommonly complicate cœliac disease, and in 1927 he investigated the blood chemistry in five such cases. The serum calcium was constantly low, and the plasma phosphorus occasionally low. Tetany was commonly present. In cases of moderate severity, the radiographic appearances of the bones were striking. There was delay in the centres of ossification, osteoporosis, and a well-marked metaphysis. Except that it was not so much splayed out, the metaphysis did not differ from that found in ordinary rickets. Single or multiple complete or incomplete, fractures of the shaft were frequently observed.

McCrudden and Fales [133] related osteoporosis and fractures to the negative calcium balance which they found in the disease. Lehndorff and Mautner [134] pointed out that a child with cœliac disease is liable to spontaneous fractures. I can find no record of histological examination of such bones. Cœliac rickets can be completely cured, even when the patient is on a fat-free diet, by ultra-violet light or irradiated ergosterol.[132] It is, therefore, fair to say, even in the absence of histological records, that the combined evidence strongly favours a rachitic origin of the bony changes sometimes found in cœliac disease.

Idiopathic Steatorrhœas of Adults.

Since the description by Herter [135] of intestinal infantilism, later authors have paid attention only to cases of steatorrhœa in children, and have forgotten that Gee also observed the condition in patients returning from India and in adults who had never been abroad. The occurrence of tetany is not uncommon in tropical sprue. It is associated with a low serum calcium, and is no doubt related to deficient calcium absorption. However, it has been found [136] that severe and cachectic cases of sprue often have a normal serum calcium. The cause of sprue is unknown, and whatever calcium defect may be found is of secondary importance only.

Cases in adults of fatty diarrhœa with tetany, accompanied by extreme wasting, occur sporadically in temperate regions. Of these it is equally true that the cause of the defective absorption of fat is unknown, and that the defect of calcium absorption is of secondary importance only. Thaysen [137] regards them as cases of non-tropical sprue, and includes them with sprue and with cœliac disease in the term "idiopathic steatorrhœas." Cases have been recorded of patients who had cœliac disease in childhood and recurring diarrhœa and tetany in adult life.

The fat in the stools is mostly split fat. There is pallor and sometimes severe anæmia.[138] In three cases I have found clubbing of the fingers. The abdomen is distended, and the colon may be dilated. Bone deformities are common and include genu valgum, genu varum, bowing of femora and tibiæ, and spontaneous fractures. I have seen one case where osteotomy of each femur had been performed. Achlorhydria is common, and the blood-sugar tolerance curve may be low.[137] The plasma phosphorus is greatly reduced, and the serum calcium may be low. Metabolism studies [139] suggest that the chief factor concerned in the calcium defect is a failure to absorb vitamin D, and that the formation of calcium soaps is not an important factor in preventing calcium absorption. Treatment by fat restriction and irradiated ergosterol is sometimes effective.

CASE 8. *Idiopathic steatorrhœa with tetany and dwarfism.*—A single woman of 34 years (L.H., Reg. No. 40440, 1928). Clinical history: She was born at full-term and was the first of four children. She was breast-fed for 12 months, and afterwards took badly to milk. At five months she cut her first tooth, and at ten months she talked. At 13 months she began to walk, when it was noticed for the first time that her knees were wrong. She was a small child. The first and second dentitions were apparently normal. At five years she began to go to school, but could never run because of her knees. She had occasional short attacks of diarrhœa.

As a child she was usually top of her class in school. As she approached the age of 14 she became weak and stopped growing, and she had vague symptoms of what she afterwards learned was tetany. One morning in March in the year she was 14, she awoke with her hands stiff and with pains in wrists, ankles, and knees. Characteristic carpopedal spasm occurred. Her hair began to get thinner and became greyish. There was no change in the skin or nails. Nine months later menstruation began. Subsequent periods have been normal in amount and somewhat irregular, with intervals of five or six weeks.

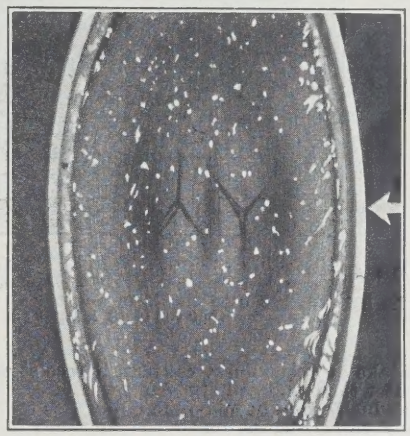
Between the ages of 16 and 24 she was semi-invalid and had to be wheeled about in a bath chair. She then improved for a time, taking an interest in people and in books, but having to rest for a period every day. Attacks of tetany occurred about four or five times every winter and, later, sometimes in the summer. They had no relation to menstruation. Early attacks were confined to the hands and feet; later ones affected also the shoulders, knees, neck, and face. Sometimes she was unable to speak for short intervals, breathing was difficult, and the eyelids twitched. Pain and spasms lasted up to two or three hours. Subsequently the muscles felt stiff and aching and remained so for three or four days.

At the age of 28 she began to have attacks of epigastric discomfort with abdominal distension, flatulence, and diarrhœa. There was complete loss of appetite (she had never been able to take milk or bacon fat). The diarrhœa often lasted several weeks. Sometimes attacks of tetany were associated with these disturbances, though there was no constant time relation between the two.

Family history: Father, mother, one sister, and two brothers alive and well. There is no history of dwarfism in the family.

Clinical examination: She is a tiny woman, thin, with the general contours of an adult, except that her head is rather large in proportion. She is mentally normal, and unusually intelligent, but she has the shyness and sensitiveness of a dwarf. Her brow is wrinkled, and her expression anxious and a little pathetic. Height 4ft. 3in. Weight 5 st. 2 lb. Voice, high and piping. Skin: pale, fine, and smooth; face freckled. Hair: thin and very fine on the head, brown and in places grey; normal on the pubes; very scanty in the axillæ. Teeth: double dentures; a few remaining molars. Eyes: Slit-lamp examination of lenses (Fig. 14). Collections of opacities in the lens similar to those seen in a case of post-operative tetany. There are central flaky opacities with some small crystalline opacities, some chromatic. Powdery opacities are seen in the nucleus of the lens. (Mr. C. B. Goulden.) Thyroid gland: present and normal in size. Hands: small and delicate in proportion to the rest of the body, resembling those of a child of 14. Trousseau sign positive. Chvostek sign never elicited. Knees: marked genu valgum, more pronounced on the right side, and so severe that she can stand only with her legs crossed, the right in front of the left. When the knees are placed together side by side, the feet are separated by eight inches. Spine: straight. Breasts: normally developed. Heart and lungs normal. Pulse regular, 82. Radial arteries normal. Blood pressure 145/90. Abdomen: rather protuberant, especially above the umbilicus.

FIG. 14.



Idiopathic steatorrhœa with tetany and dwarfism (Case 8).
Opacities in the lens, as seen with the slit-lamp.
(From drawing by Theodore Hamblin Ltd.)

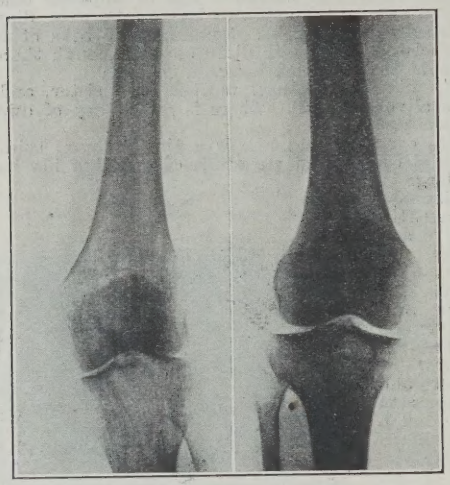
Special examinations.—Urine normal. Urinary diastase index, 5. Renal efficiency tests: blood-urea 0·028 per cent. Phenolsulphonephthalein excretion, 25 per cent., 12·5 per cent., 10 per cent., in successive hours. Urea concentration up to 3·36 per cent. Blood: red cells 4,600,000 per c.mm. Hæmoglobin 62 per cent. Colour-index 0·67. White cells 6320 per c.mm. Polymorphonuclear neutrophils, 58 per cent; eosinophils, 0·5 per cent.; small lymphocytes, 26·5 per cent.; large lymphocytes, 3·5 per cent.; large hyaline cells, 11·5 per cent. Serum calcium: 8·2 mg. per 100 c.cm. Plasma inorganic phosphorus: 2·4 mg. per 100 c.cm. Fractional test-meal: achlorhydria. Fæces: pale and porridgy; three separate determinations of their fat content gave the following results:—

	Per cent.	Per cent.	Per cent.
Total fat	60	51	65
Unsoaped fat	57	26	38

Radiograms of bones: There was a uniform diminution of density of X ray shadows of bones (Fig. 15) contrasted with those of a control subject of the same age, sex and build exposed simultaneously on the same negative. The epiphyses were united. The metaphyses of many of the long bones showed faint transverse "lines of cessation of growth" up to five in number.

The serum calcium curve.—The variations in serum calcium throughout the 13 months she was under observation are shown in Fig. 16. In March and April, 1928, it lay between 6 and 8 mg. per 100 c.cm. Then, during the three weeks when irradiated ergosterol was being given, with a daily

FIG. 15.



Case 8.—Controlled radiogram showing diminished density of X ray shadows of bones in idiopathic steatorrhœa.
The negative has been cut down and the two portions placed together for close comparison.

intake of about 0·5 g. calcium, it rose steadily to 10·8 mg. After the irradiated ergosterol was discontinued it declined gradually, and in mid-June fell as low as 7·2 mg. In July and early August, under the influence of a high calcium diet and large doses of calcium lactate, it climbed steadily from 8·7 mg. to a maximum of 12·1 mg., and throughout August, when irradiated ergosterol was superadded, it remained between 11 and 12 mg. In September when the calcium intake was reduced to less than 1 g. a day, and a severe attack of intestinal discomfort with diarrhœa was in progress, it fell again, fairly rapidly, to 8·6 mg. During the winter a very slow and somewhat irregular decline continued, till on March 25th, 1929, the very low level of 5·0 mg. was reached. For most of this time up to Feb. 21st the calcium intake was below 0·6 g. daily, and the fat content of the diet was minimal. During March, when the calcium intake had been raised to 1·8 g. daily and the diet was also rich in fat, the decline continued. In April the intake was about 1 g. a day, and ultra-violet light treatment was begun. The result was a prompt rise in serum calcium level from 5·7 to 8·5 mg. in three weeks.

The observations thus show clearly that a definite rise in the serum calcium level could be produced by any one of three agencies, namely: (1) irradiated ergosterol (with low calcium intake); (2) high calcium diet with superadded large doses of calcium lactate; (3) ultra-violet irradiation.

The tetany.—Trousseau sign was present when she was admitted, and remained present throughout the rise of the serum calcium curve to 10·8 mg. in response to irradiated ergosterol. In the second, more marked, and better sustained rise, produced by high calcium intake and irradiated ergosterol, the sign disappeared when the curve reached 10 mg. and did not appear till it declined sharply 2½ months later to 8·6 mg. Even then it was not elicited in October when the serum calcium was 8·5 mg., but it reappeared in November and remained continuously present, except for two occasions in January, until the following April. Then following five days' exposure to ultra-violet light it promptly disappeared, while the serum calcium still remained at 6·8 and 6 mg., and was not again elicited before the patient's final discharge.

These observations show that there is a general relationship between the liability to tetany as tested by the Trousseau sign and the serum calcium level, in that the sign is present when the calcium is low and tends to disappear when it rises, but the relation is not a fixed or constant one. The disappearance of the sign after irradiation, before the serum calcium had risen above 6 mg., is very striking, and it may be significant that the period of absence of the sign during the time of high calcium intake and high serum calcium level (July and August) occurred at the height of the summer, when the patient was receiving a certain amount of sunshine.

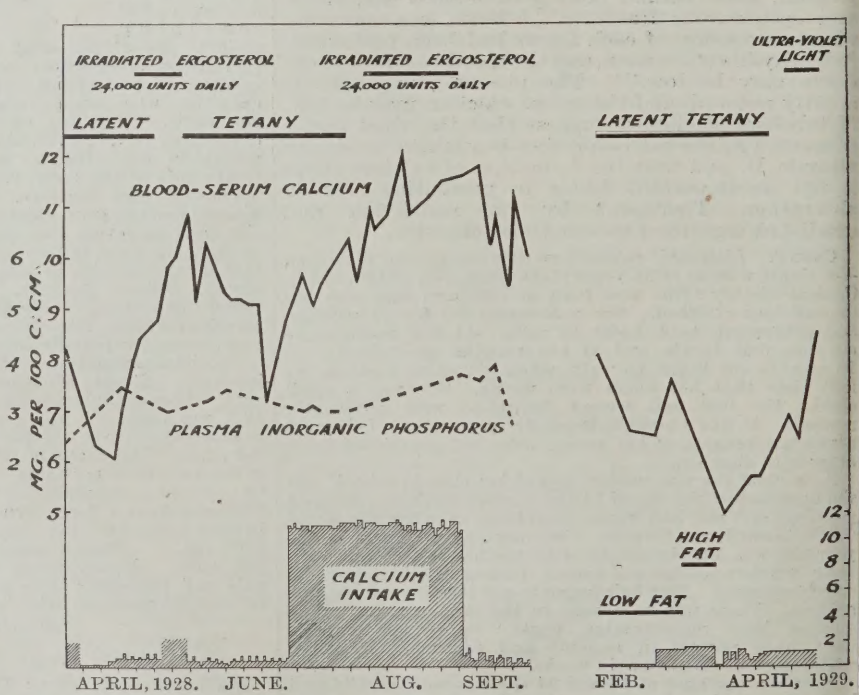
TABLE III.—*Chemistry of the Blood in a Case of Renal Rickets.*

Date.	Serum Ca.	Plasma P.	Plasma phosphatase.	Blood-urea.
Aug. 21 ..	7·4	3·5	—	0·090
Nov. 9 ..	7·9	—	—	0·111
Dec. 30 ..	6·8	5·0	1·03	0·141
Jan. 14 ..	7·1	5·0	—	0·174
Feb. 4 ..	6·0	6·0	1·2	0·252
Feb. 25 ..	6·0	5·8	1·13	0·117
March 13 ..	5·5	5·5	0·99	0·093

Renal Rickets.

The clinical characteristics of renal infantilism or dwarfism are now well known. The stunting of growth and delayed union of epiphyses often occurs without clinical or radiological evidence of rickets. It is equally certain that rickets occasionally complicates renal dwarfism, and, in one such case, Prof. H. M. Turnbull has demonstrated all the histological

FIG. 16.



Case 8.—Chemistry of the blood in idiopathic steatorrhœa with tetany and dwarfism.
The interval marks on the abscissa represent weeks.
Where the calcium intake exceeds 2 g., calcium lactate had been added to the diet. T dosage of irradiated ergosterol was measured in antirachitic rat units. Ultra-violet light w given by the mercury-vapour quartz lamp. The presence of Trousseau sign has been chart as latent tetany.

characteristics of true rickets. And yet this condition is not due to lack of vitamin D, but to a disturbance of endogenous calcium and phosphorus metabolism for which the chronic nephritis is evidently responsible. It is generally supposed that phosphate retention, due to the renal defect, is primarily responsible for the changes in the bones. Table III., from a case of renal rickets in a boy of 17, shows how the plasma inorganic phosphorus rises with the rise in blood-urea. The serum calcium tends to fall as the plasma phosphorus rises, hence the high incidence of tetany in this disease.

Diagnostic Value of Serum Calcium and Plasma Phosphorus.

We are now in a position to consider the value of the serum calcium and plasma phosphorus used as an aid to diagnosis. In Table IV. the first three columns

TABLE IV.—*Value, as an Aid to Diagnosis, of Serum Calcium and Plasma Phosphorus.*

—	Rickets.	Osteomalacia.	Steatorrhœa: tetany.	Hyper-parathyroidism.	Post-operative tetany.	Hypo-parathyroidism.	Renal rickets.
—	—	—	M. 56	F. 41	F. 43	M. 14	M. 18
Serum calcium.	9·6	6·0	5·8	16·7	6·3	4·9	7·4
	8·8	7·4	5·9	16·7	3·9	5·0	6·8
	9·7	5·6	4·7	15·8	6·4	5·3	7·1
	10·2	5·2	5·2	15·5	5·7	5·3	6·0
	—	7·0	4·9	—	3·9	5·2	6·0
	—	5·0	3·9	—	—	5·4	—
	—	—	3·9	—	—	—	—
Plasma phosphorus.	1·6	1·9	1·8	2·5	4·7	10·4	3·5
	2·9	1·8	1·0	1·0	5·0	10·7	5·0
	1·2	2·3	1·3	1·5	6·5	10·6	5·5
	1·6	2·5	1·5	1·7	6·0	10·4	6·0
	—	2·4	1·8	—	6·0	10·9	5·8
	—	2·0	1·8	—	—	10·9	—
	—	—	1·0	—	—	—	—

depict those conditions where absorption and utilisation are at fault. The plasma phosphorus is low in all three; the serum calcium is low, except in rickets where it is usually normal. In the last four columns are recorded repeated observations on the blood chemistry of individual cases, in all of which the endogenous calcium metabolism is at fault. Here an inverse ratio holds between calcium and phosphorus readings. In hyper-parathyroidism parathyroid *hyper*-function keeps the calcium high and the phosphorus low. In post-operative tetany and spontaneous hypo-parathyroidism, owing to parathyroid *hypo*-function, the reverse holds good. The result is that the serum calcium may be as low as

TABLE V.—*Chemistry of the Blood in Osteitis Deformans.*

Sex.	Age.	Serum Ca.	Plasma P.	Plasma phosphatase.
M.	49	10·8	3·3	0·66
M.	41	8·6	3·5	>1·4
F.	39	10·0	3·3	>1·3
F.	54	8·9	3·0	>1·2
M.	69	8·4	3·5	>0·7
F.	69	9·5	3·2	>1·2
M.	65	8·2	3·3	1·06

4·9 mg. per 100 c.cm., and the plasma inorganic phosphorus as high as 10·9 mg. per 100 c.cm. In renal rickets the plasma inorganic phosphorus is high, and the serum calcium low.

Osteitis Deformans.

In Paget's osteitis deformans the serum calcium and plasma phosphorus are approximately normal. Such studies as have been made of the calcium balance have given conflicting results, but no departure from the normal of any magnitude has been demonstrated. The discovery by Kay [21] that the plasma phosphatase is constantly high in this disease is of great interest (Table V.), though its exact significance has still to be discovered. It is useful in diagnosis though it is not pathognomonic, since high figures are also found in generalised osteitis fibrosa, secondary carcinomatosis of bones, and in some cases of exophthalmic goitre.

Osteogenesis Imperfecta.

In osteogenesis imperfecta (Table VI.) no abnormality in the serum calcium, plasma phosphorus, or calcium output has been satisfactorily demonstrated.[140] The plasma phosphatase is, in some cases, slightly raised. The cause of the defective osteoblastic apposition of bone is quite unknown. There are two cases recorded which showed enlargement of the parathyroids. The seven-months fœtus described by Bauer [141] had four enlarged parathyroids, the largest the size of the adult gland (3 mm. diameter). Histologically these showed hyperplasia. He relates

TABLE VI.—*Chemistry of the Blood in Osteogenesis Imperfecta.*

Sex.	Age.	Serum Ca.	Plasma P.	Plasma phosphatase.
F.	12	9·6	4·3	0·223
M.	9	10·4	4·5	0·270
M.	9	9·9	—	0·374
M.	17	10·3	3·8	0·331
M.	20	9·7	4·5	0·168
M.	42	9·6	2·8	0·162

that Dietrich [142] described another case. In the present state of our knowledge such observations are without explanation.

STORAGE AND EXCRETION OF LEAD.

Studies of lead poisoning have revealed a close analogy between the storage and excretion of lead and of calcium. Since lead is a cumulative poison there must be some place in the body where it can be retained in fairly large quantities. The work of Gusserow [143] in 1861, followed by that of Heubel,[144] showed that this storehouse was the skeleton. Minot and Aub [145] demonstrated quantitatively in animals and man a selective localisation of lead in the bones which becomes practically complete after absorption has ceased. Fairhall [146] studied such bones, and the results of his experiments suggest that the lead is present as the very insoluble tertiary phosphate. Various experiments showed that this is deposited in the calcareous portion of the bone and not in the marrow.

During different stages of intoxication by lead its distribution within the body varies somewhat. During slow absorption it migrates to the storehouse in the skeleton where about 95 per cent. is held without harm during the chronic stages of plumbism. However, if large quantities of lead are being absorbed or are being liberated from the bones, lead is distributed throughout the tissues and the percentage in the bones is reduced. Under these conditions symptoms of acute poisoning may occur. Working with human autopsy material, Minot and Aub have shown that the total amount of lead stored in the skeleton in lead workers varies from 0·2 to 0·8 g.

Lead stored in the bones may be gradually excreted in minute amounts over long periods. It has been found in the stools of persons who have been removed from exposure for more than two years, and Sir Thomas Oliver reports finding it in the urine of a woman 11 years after exposure. Thus, as suggested by Straub [147] in 1911, and by Erlenmeyer,[148] there may be an intermittent stream of lead entering the circulation to be excreted gradually.

Effect of Ammonium Chloride on Elimination of Lead.

Aub and Minot studied the conditions favouring and hindering liberation of lead from the bones in cats experimentally poisoned with lead. Early in their investigations they found that during starvation acute symptoms may develop, and at necropsy lead is found distributed more generally through the body than is typical of the chronic condition. This suggested that during starvation there is some abnormality in metabolism which sets free lead from the bones. Acidosis seemed the most probable explanation for the change, and an investigation based on this hypothesis was undertaken.

Lead workers were placed on a low calcium diet and were given either hydrochloric acid, phosphoric acid, or ammonium chloride in large doses. The excretion of lead in the fæces was markedly increased. The probable reason for the increased liberation of lead during acidosis is to be found in the experiments of Fairhall.[146] He studied the effect of variations in the hydrogen-ion concentration upon absorption of lead by bone. The tertiary phosphate of lead has an extremely low solubility at the normal pH of the body. However, under slightly more acid conditions, it is readily converted into the secondary phosphate of lead ($PbHPO_4$) which is a hundred times more soluble. Hence the ingestion of acid probably serves to liberate lead from the skeletal stores by converting it into a more soluble salt.

Effect of Parathyroid Extract in Lead Poisoning.

When active parathyroid extracts became available, the opportunity occurred for the direct confirmation of the hypothesis that the metabolism of lead is analogous to that of calcium. We [22] kept patients with chronic lead poisoning on a low calcium diet, and then gave them parathormone, with a view to determining the total output of calcium and of lead. For, under these circumstances, any large and prolonged rise in the blood calcium and in the calcium excretion would occur at the expense of the skeleton, and it was our purpose to discover whether or not the lead deposits would be mobilised with the calcium.

Parathormone definitely increased the excretion of lead when first given (Fig. 17). The amounts excreted were far greater than those obtained when potassium iodide, ammonium chloride, or phosphoric acid were given. When parathormone was given a second time, little or no increase in lead excretion was observed, though the extract was known to be potent because it produced its characteristic effects on calcium metabolism. Evidently parathormone rapidly and effectively mobilises from the bones a certain amount of stored lead which is readily available. The remaining lead is mobilised much more slowly in the normal routine of metabolism.

In our six patients the rapid mobilisation and elimination of large amounts of lead produced no ill-effect. However, we are not unaware that the procedures we used were very drastic and, used without due care, might produce the acute toxic episodes of plumbism. The action of parathormone in lead poisoning confirms the theory that there is a striking parallelism between the storage and excretion of calcium and of lead.

CASE 9. *Chronic industrial lead poisoning.*—A man of 55 years (M.G.H., Reg. No. 273240, 1925) had been employed for seven years in the mixing-room of a rubber works where a powder containing oxides of lead was used for vulcanising. The occupation was very dusty. For two months he had had attacks of generalised abdominal pain with severe constipation. The pain had persisted every day, and was often sufficiently severe to double him up. He had had a similar attack three years before. Exposure to lead last occurred two months before admission.

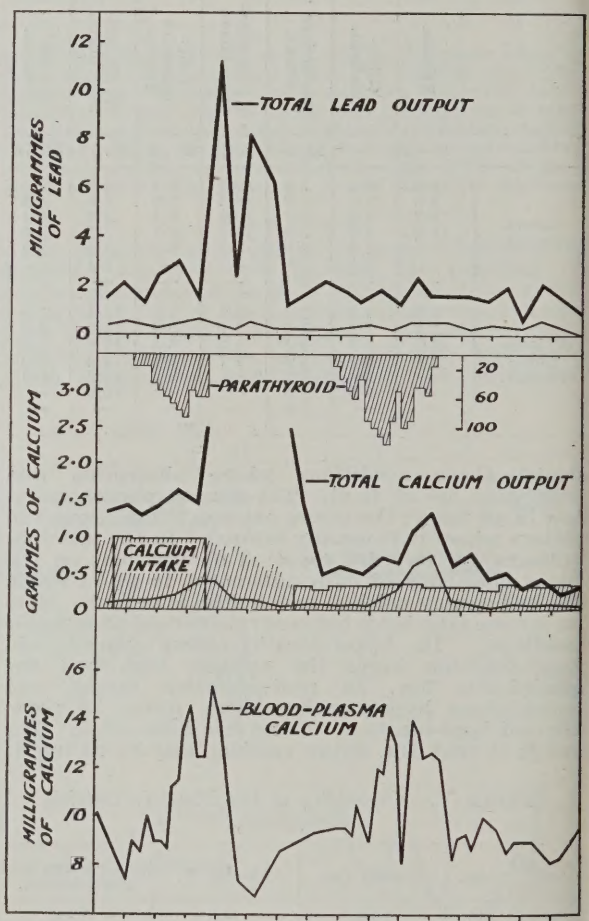
On examination he had a sallow appearance and a marked blue line on the gums. The abdomen was flaccid and showed no tenderness. No abnormal physical signs were found in the nervous system. The red cell count was 3,120,000 per c.mm., with marked stippling of the cells. Hæmoglobin 50 per cent. White cell count 8200 per c.mm. Polymorphonuclears 60 per cent. Lymphocytes 30 per cent.

After treatment of the constipation and five days on a high calcium intake all pain ceased. The effects of treatment by parathormone are to be seen in Fig. 17. The general condition continued to improve. After three months the blue line on the gums was scarcely more than a faint speckling. The red cell count was 4,100,000 per c.mm., and very few stippled cells could be found. The hæmoglobin was 70 per cent.

Storage of Other Elements in Bone.

There is a tendency for the selective localisation in bone not only of lead but also apparently of arsenic,[149] mercury,[150] silver,[151] and radium. Recently Flinn and Seidlin [152] have used parathormone in an attempt to increase the elimination of radium from the bones in factory workers poisoned by radium and mesothorium compounds. Such poisoning is known to occur where girls employed in painting the dials of luminous watches are in the

FIG. 17.



Case 9.—Effects of parathyroid extract and diet upon the excretion of lead and of calcium in lead poisoning.

The interval marks on the abscissa represent five days.

In the upper portion of the chart is shown the lead excretion. The faint line is the excretion of lead in the urine expressed in output for three days. The heavy line is the total excretion of lead in the urine and fæces for three-day periods.

In the middle portion of the chart the upper blocks represent treatment by parathormone; the adjacent scale represents units per day. The lower blocks represent the calcium intake in three-day periods, and, where the figure exceeds 0·7 g., calcium lactate had been added to the diet. The areas which have no enclosing block-line represent periods of unweighed high calcium diets. The faint line is the excretion of calcium in the urine expressed in output for three days. The heavy line is the total excretion of calcium in urine and fæces for three-day periods. The distance between heavy line and blocks, therefore, represents the positive or negative calcium balance.

In the lower portion of the chart is shown the blood-plasma calcium.

habit of pointing their brushes with their lips. Necrosis of the jaw and aplastic anæmia may result from the poisoning, alpha radiation being enormously destructive of the bones in which it is stored and also of the adjacent hæmopoietic marrow.

Use of Calcium Salts in Therapeutics.

A survey of the results of calcium administration in disease at once shows that, as a therapeutic agent, it has proved disappointing. The constant supply of calcium in the food and the large available store in the bones make it unlikely that the regulating mechanism ever lacks calcium for distribution throughout the body. It is when the function of some part of this mechanism breaks down that the tissues suffer from calcium deficiency. It therefore follows that the use of cod-liver oil, ultra-violet light, irradiated ergosterol, parathyroid or thyroid extract is often of greater value than the direct administration of calcium salts.

Need for a Diet Adequate in Calcium.

The use of well-balanced diets is not a necessary counterpart of an advanced civilisation. Thus it has been calculated[153] that the diet of the Finns contains between 2 and 6 g. CaO daily, whereas the equivalent figure for the average diet in the U.S.A. is only 0·45 g. Sherman[1] regards this figure with some alarm since he considers that one gramme a day is really required. He urges the use of "calcium carbonate or phosphate habitually added to human food by mixing it with table salt . . . or a more liberal use of milk, which is an important source of proteins of high nutritive efficiency and of the fat soluble vitamin as well."

If, then, a diet containing little calcium is to be regarded as a potential source of harm, how much more harmful must be the food consumed over large areas of China and India. There the diet may be deficient in calcium or phosphorus, may contain an excess of acid-forming over base-forming mineral elements, and above all is very likely to be deficient in vitamins or to be consumed by women kept in darkness.

A high calcium diet of adequate vitamin content is required by pregnant and lactating women to allow for the drain of calcium into the fœtus and especially through the mother's milk.

Owing to the great loss of calcium from the skeleton in exophthalmic goitre, attention should be paid to the mineral content of the diet in this disease.

Tetany.

In post-operative tetany success in treatment will vary according to how much parathyroid tissue has been destroyed. Calcium lactate may be employed as a powder taken fasting in repeated doses up to a total of 10 to 30 g. daily. In our experience these large quantities have never caused discomfort of any sort. Too often a few grains are given, in which case we can hardly expect much effect, since we know[154] that in normal individuals the maximal rise in serum calcium after a dose of 10 g. is only 14 per cent. More severe cases require parathyroid extract in addition to calcium salts, and even this may be ineffective when extirpation of the glands has been extensive. The onset of laryngeal spasm, bronchial spasm, or convulsions demands intravenous therapy; 20 c.cm. of a 5 per cent. solution of calcium chloride may be injected into a vein, and, if given very slowly, no ill-effects are produced. The use of thyroid extract and irradiated ergosterol in post-operative tetany has hardly passed the experimental stage.

Cameron [155] recommends the intramuscular injection of 1 gr. of calcium chloride in infants with laryngismus. In the tetany of rickets or osteomalacia the use of parathyroid extract is contraindicated except in emergency, since the increased serum calcium is brought about by the removal of calcium from the bones, which are already deficient in it. The administration of cod-liver oil or ultra-violet light may be all that is necessary for the proper treatment of the rickets or osteomalacia and for the relief of the tetany.

Lead Poisoning.

In the prevention of industrial lead poisoning a diet of high calcium content plays its part. In lead works in this country it has for many years been customary to supply the workmen, free of cost, with a glass of milk in the morning. This is empirical treatment of considerable merit, anticipating as it did by many years the discovery that a high calcium intake assists the storage of lead in a harmless form in the bones.

The toxic episodes of lead poisoning—namely, lead colic, lead palsy, and meningo-encephalopathy—may be regarded as urgent indications for calcium therapy. In this country the Home Office Regulations, by control of dusts and fumes, have abolished meningo-encephalopathy, but it would be idle to suppose that lead colic and lead palsy have disappeared from industry. It is difficult to estimate the death-rate in meningo-encephalopathy; it is probably quite high. Aub[51] states that of six cases three recovered promptly when given large quantities of milk and calcium lactate, and three died without such treatment. During the development of lead palsy a high calcium diet should be used to favour storage of lead.

After the acute toxic episodes have passed, elimination of lead may be accelerated by the use of a low calcium diet together with ammonium chloride. This is administered cautiously in 1 g. doses given in a glass of water six or eight times a day. Provided there is no nausea or headache this treatment is continued for two or three weeks, the patient being kept on a diet containing a strict minimum of 100 mg. of calcium a day.

Should any toxic episode appear, ammonium chloride must be stopped and a high calcium diet used to favour the storage of lead.

It is necessary to emphasise the difference between the use of agents assisting the excretion of lead and those assisting its storage. The acidosis method of lead elimination is so potent that its use during colic or meningo-encephalopathy might prove fatal, from the further mobilisation of lead at a time when the reverse procedure is essential in treatment.

Colic.

The question of the relief of lead colic by calcium therapy involves more than simply the tendency to favour storage; there is evidently an anti-spasmodic action on involuntary muscle. The only experimental evidence bearing on this is that of Kennedy,[156] who reported that by increasing the calcium content of the fluid bathing the uterine strip, the result in the uterine muscle was both a loss of tone and of peristalsis. The pain of lead colic is probably due to a contraction of the tonic ring in the intestine with marked peristalsis approaching this. A high calcium diet usually brings relief within 48 hours. In severe cases, by the slow intravenous injection of 15 c.cm. of a 5 per cent. solution of calcium chloride, it is possible to relieve the pain by the time the injection is over. The patient feels hot and flushed and may vomit. The effect on the pain is very striking and is far superior to that of any other means of therapy. Should it be necessary, the injection may be repeated in two hours.

By the same method Aub has brought about prompt relief from renal colic and gall-stone colic. Theoretically the relief of spasm should help in the passage of the stone, but this remains to be seen. An additional advantage of this method is that a differential diagnosis between the pain of renal colic and appendicitis can be made, the former being relieved promptly, the latter persisting.

Œdema and Inflammatory Exudates.

French workers, notably Blum,[157] have pointed out the diuretic action of calcium chloride in œdema. This is not a specific effect of calcium; it apparently results from a change in the balance of ions in the body fluids. Blum maintains that by increasing the calcium ions the sodium ions are decreased, and, since the retention of fluids is closely associated with the retention of sodium, the œdema is decreased.

Fraser[158] offers an alternative explanation. He points out that since ammonium chloride acts in a similar manner it is probably the acid properties of these salts which are responsible for their diuretic action, though the calcium may have an effect in the same direction by its antagonistic action to sodium.

Blum has extended his observations to inflammatory exudates and has reported beneficial effects in pleural and peritoneal effusions and in conjunctivitis. Workers on similar lines claim beneficial results for the administration of calcium chloride in asthma, angioneurotic œdema, and urticaria.

Acute Necroses of the Liver.

The accidental discovery by Minot[159] that a low calcium diet rendered dogs more susceptible to carbon tetrachloride poisoning led her to investigate extensively the chemistry of the blood in acute necroses of the liver.

Carbon tetrachloride causes a severe intoxication in dogs on a meat diet, while the addition of calcium salts to such a diet produces a high degree of tolerance to the drug. The symptoms of poisoning are gastro-intestinal irritation and hyperexcitability, followed by depression. There is a retention of guanidine in the blood and a hypoglycæmia. The relief and protection given by calcium seem to depend upon its antagonistic effect to the retained guanidine. When calcium is administered to poisoned animals the nervous symptoms are relieved and the blood-sugar is restored to normal. However, if the blood-sugar is raised by the administration of glucose, the hyperexcitability persists until calcium is given in addition. Similar results were obtained in a study of chloroform poisoning in dogs.

The investigation was then carried to liver disease in the human subject and more especially to eclampsia. Some cases showed hypoglycæmia and guanidine retention, and, where this was the case, prompt symptomatic relief followed the intravenous injection of 10 c.cm. of a 10 per cent. solution of calcium gluconate. For example, in a woman with eclampsia who was semi-conscious and blind, within 15 minutes of the injection the vision was much improved, within 40 minutes the sight was restored, and the blood-sugar raised towards normal. Though the number of cases studied was small it is clear that such a highly protective action of calcium salts against liver poisons is worthy of further investigation.

Milk Fever of Cows.

The essential clinical feature of "parturient paralysis" or "milk fever" of the cow is tetany. It may be confined to the hind limbs or it may be generalised. It is followed by deep coma and often by death. The cause of the condition is unknown but acute hypocalcæmia[160 161] is the determining cause of the symptoms. In its treatment inflation of the mammary gland has been practised for many years. It is now known that mammary inflation produces a rapid and regular rise in the blood calcium, and that this rise is concurrent with, and bears a direct relation to, the disappearance of the symptoms of the disease. Intravenous and subcutaneous injections of calcium gluconate[162] have been used successfully in treatment. It has been shown in the sheep[162] that "lambing sickness" or "ewe distemper" is identical in its essential pathology with "milk fever" in the cow.

[The lecturer closed with acknowledgments for grants received at various times towards the expenses of his work from the Yarrow Research Fund, the National Lead Institute of North America, the Rockefeller Foundation, the Ella Sachs Plotz Foundation, and the British Medical Association. He also thanked Prof. Aub of Harvard, Prof. H. M. Turnbull for their expert collaboration, and various colleagues on the staff of the London Hospital for the use of their cases and help in the wards.]

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CHRONIC STREPTOCOCCAL ILLNESSES.*

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THE chronic illnesses commonly attributed to the streptococci are so varied and different, and the ætiological rôle of the streptococci in their production is or has been so hotly debated, that the best way of considering them as a whole is to review the evidence of a streptococcal origin of the main chronic streptococcal illnesses in turn in order to see what their relationship is, if any, and what are the factors which make any one disease different from the others. It may be urged that rheumatic carditis and ulcerative endocarditis are not chronic illnesses, but both of them may run a course of many months. Further, their consideration in conjunction with the others may help to throw some light on the obscure problems of streptococcal infection.

The first record of the association of streptococci with rheumatic carditis was that of Birch-Hirschfeld in 1888.[1] Thereafter, various observers reported streptococci, among others, as the causal organisms, until in 1900 Poynton and Paine [2] described the organism which they labelled *Diplococcus rheumaticus*. This was practically the start of the "streptococcal theory" of rheumatic carditis. Since that time different workers have found streptococci, but almost an equal number have recorded negative findings. When the streptococcus in question is identified more completely it is found to be non-hæmolytic and gives similar sugar reactions to those of the streptococci normally inhabiting the alimentary tract. Horder [3] showed that the same organism is the commonest infective factor in subacute bacterial endocarditis, and suggested that the cases of "malignant rheumatism" from which Poynton and Paine isolated their organism were actually cases of subacute bacterial endocarditis—a very important criticism if it is correct. The streptococci described by different workers showed minor variations in cultural characteristics, and Swift and Kinsella [4] pointed out that if streptococci have any causal relationship to rheumatic carditis no one type of the anhæmolytic group is concerned. Neither has it been possible with any degree of constancy to demonstrate agglutinins or other antibodies in the patient's blood to the organisms recovered from him. Animal experimentation, too, is negative, as no undoubted rheumatic lesion has yet been produced in animals. Injection of "rheumatic" streptococci produces arthritis and endocarditis, exactly as do injections of alimentary streptococci, but in all these cases the endocarditis is of the ulcerative type, and no rheumatic myocardial lesions are produced. The one exception is the possible production of "rheumatic nodules" by Clawson [22] by subcutaneous injection of anhæmolytic streptococci.

A fresh impetus to the streptococcal hypothesis was given in 1927 by Small [5] who described the "*Streptococcus cardio-arthritidis*" which produced a soluble exotoxin from which an antiserum was prepared. This antiserum is said to give encouraging results therapeutically. Birkhaug [6] then investigated the skin reactions produced by the exotoxin of a non-methæmoglobin-producing streptococcus obtained from cases of rheumatic fever. He found that a far higher percentage of patients who had suffered, or were suffering, from rheumatic fever gave a positive reaction than did normal healthy people. Irvine-Jones,[7] Kaiser,[8] Hart,[9] and others described similar findings, but there is no conclusive evidence whether the positive skin reaction indicates a susceptibility to infection, or a sensitised allergic state of the patient similar to the tuberculin reaction. The skin reaction showed no specificity to any one strain, and the investigators suggest that a rheumatic infection is an allergic response by patients previously sensitised to the common streptococci of the respiratory and alimentary tracts. Hitchcock and Swift [10] have shown in rabbits that different groups of the "indifferent" streptococci possess varying degrees of allergising capacity, and that the rabbits also show variations in their reactive capacity to any one organism from the allergic standpoint. Faber's [11] experiments are suggestive, showing that a previous infection of one joint by streptococci, when followed by a later intravenous inoculation, constantly produces arthritis in that joint. Intravenous injection with no previous sensitisation is without effect until repeated at least two or three times, which suggests an analogy to the primary development of the lesion of rheumatism in man.

The conclusions drawn by Coombs and Poynton [12] in the British Medical Association Report sum up very well the present position. They say that while the case for the streptococcal theory is not proved, it has as yet no rival. The more recent skin reactions and the allergic theory have rather strengthened the case for the streptococcal origin of rheumatism, so that it seems quite fair to include this as a chronic streptococcal illness, for the chronic smouldering character of the infection has long been recognised clinically.

Endocarditis.

The nomenclature of endocardial lesions is at the moment very confused because various workers have attempted to describe different clinical groups under differentiating names. However, as the ætiology and morbid anatomy of these groups essentially differs only in the virulence of the infecting organism, the condition may for convenience be called ulcerative endocarditis, which serves to distinguish it from the endocarditis associated with rheumatic pancarditis. The pathology of the acute fulminating cases which follow a general septicæmia is obvious, and they usually run an acute course, so that they can hardly be included as a chronic illness although a large percentage of them may be due to a virulent hæmolytic streptococcus. A large proportion of the subacute or chronic group, cases which may frequently run a course of over 12 months, and may, therefore, with some justification be called "chronic," are due to a streptococcal infection. Schottmüller [13] was the first to describe a streptococcus isolated from the blood of cases of endocarditis. This streptococcus was non-hæmolytic, and as it produced a green coloration when grown on blood-agar he called it *Streptococcus viridans*. Andrewes and Horder [14] and Gordon [15] showed that this organism belonged to the common types of streptococci found in the alimentary canal. Many workers have confirmed these findings, and statistics from various sources show that as many as 75 per cent. of cases of endocarditis may be shown to be due to an infection with the streptococcus.

The outstanding point in the ætiology of ulcerative endocarditis is the frequency with which this condition follows congenital cardiac defects and rheumatic carditis. The lesion is always localised and only spreads by direct implantation, and the myocardial lesions are embolic only—that is, the condition is purely an endocarditis. Recently, Grant [16] has shown that congenital defects and also previously damaged valves are frequently the site of small fibrinous deposits. Apparently organisms which, by some temporary breakdown of the surface resistance, have entered the blood stream, settle on these fibrinous tags and form a nidus of infection, in which they are safe from the normal bactericidal action of the blood. Presumably, such temporary invasions of the blood stream by the normal flora of the alimentary tract are not infrequent and are usually dealt with successfully by the normal antibodies. The infection and the localisation

*Awarded the Buckston Browne prize for 1929 by the Harveian Society of London, by whose permission it is published. Working under a Colston Research Fellowship.

cannot be due to a loss of general resistance because of its localisation, and also because patients with such a lesion show a very high antibody content in their blood against the infecting organism, as has been shown by Kurtz and White [17] and other workers. Yet these patients are powerless to deal with the local infection and die, either as the result of large emboli or from uræmia, the sequel of embolic nephritis, or from cachexia and general toxæmia, from the repeated bombardment of the whole body with minute emboli. The local lesion, even the presence of the organisms in the peripheral circulation, appears to play a very small part in the actual illness. Further, cases of ulcerative endocarditis due to organisms other than streptococci show no clinical and very slight, if any, pathological differences from the streptococcal infections.

It has been repeatedly shown that the injection of streptococci of the alimentary tract into animals will reproduce the clinical and pathological picture of endocarditis in animals. A similar condition occurs in pigs after swine erysipelas. This disease, which is due to *Bacillus rhusiopathiæ suis* and is essentially an acute specific fever associated with a septicæmia, is followed in a certain number of cases by an endocarditis. This runs a very slow and protracted course, and corresponds in all essentials with the endocarditis occurring in man as the result of infection with a streptococcus of low virulence. It is clear that the organism itself is not the important factor of the disease, but rather a peculiar condition resulting from the localisation of the infective process.

Focal Infection.

It has been said that the pathology of focal infection is largely the pathology of the streptococci.[18] This being so, focal infection and its results obviously constitute one of the chronic streptococcal illnesses. The evidence for the existence of "focal infection" as a cause of chronic illnesses is rather vague and indefinite. The main "proof" seems to be that a condition improves after the removal of some septic focus, but this by no means proves that the condition was due to the focus of infection. It may improve after the removal of the "focal infection" for the simple reason that the patient's general condition is improved, without there being any closer relationship between the two infective processes. The case for focal infection is also weakened by the countless people who for years carry about septic tonsils or chronic apical dental infection and yet never develop any secondary condition. These cases show that if focal infection is a cause of chronic illnesses, even including vague general ill-health, the important and deciding factor in its occurrence is not the infection nor the infecting organism but the patient. The illness most confidently ascribed to focal infection is chronic arthritis, but so confused is this at the moment by the conflicting opinions as to nomenclature and types that even here its ætiological rôle does not seem too certain. However, if we accept the classification adopted by Douthwaite [19] and divide chronic arthritis into atrophic or rheumatoid, hypertrophic or osteoarthritis, and chronic infective arthritis we find that in the last group a very large percentage of the patients do present septic foci, and that the efficient removal of these leads to the cure of the condition. But there is very little, if any, sound evidence that the other two groups are due to "focal infection."

Apart from these "general" illnesses, streptococci may produce chronic "local" illnesses. These are of the nature of surface infections, and include such lesions as chronic tonsillitis, chronic bronchitis, and nasal sinusitis. In all of these the infection is usually a mixed one in which, however, streptococci predominate, amongst other organisms of doubtful pathogenicity. In apical dental infections, too, the most constant bacteriological findings are streptococci. In many such "local" infections the patient experiences no trouble except the local condition. In others he suffers from vague indefinite ill-health which improves after the eradication of the septic focus. This class includes cases like secondary anæmia or indefinite dyspepsias which clear up on removal of the dental sepsis. In yet another group the condition is associated with a definite disease entity, such as chronic infective arthritis. There appears to be no correlation between the degree of local damage or the type of infecting organism and the general systemic lesions. As has been pointed out, alleviation of the disease after the removal of the septic focus is not proof that the latter is the cause of the former, but it is certainly very suggestive. If this be accepted as a working hypothesis, it is clear that the one factor which is responsible both for the occurrence of systemic lesions and for the type they may take lies in the patient and is not a property of the infecting organism.

Recently, Wilkie [20] has produced evidence that a chronic cholecystitis is due to a blood-borne mural infection of the gall-bladder with streptococci. He claims to have shown also that the streptococci have a selective localisation, and pick out the gall-bladder, leaving other organs unaffected. It is interesting to note that repeated intravenous injections were necessary to produce cholecystitis with calculi in rabbits. This touches on the theory of elective localisation, so ardently championed by Rosenow. While admitting that certain organisms, such as *Bacillus typhosus* and the pneumococcus, do show a predilection for certain organs, one cannot help feeling that the evidence that the streptococci exhibit similar characteristics is as yet far from convincing. Trauma or previous sensitisation do definitely exert a localising effect, but that any one group of the streptococci possess the property of picking out one organ for the site of their activities requires more proof than is as yet forthcoming. Rosenow would go further than this, as he believes that organisms isolated from the tonsils of a patient suffering from appendicitis will produce appendicitis on animal injection. This work has received much criticism and very little confirmation, and up to the present time his case is very far from proved.

The Absence of Specificity.

When one reviews the wide range of chronic illnesses which are at the moment attributed to streptococci one is struck by the fact that there is no specificity in the type of streptococcus producing the lesion. The hæmolytic streptococci are rare as the causal organism of a chronic illness, so rare that in fact their occurrence may be doubted. The types which are found in these chronic illnesses are of the non-hæmolytic or *viridans* group. The difficulty of any accurate method of classification of the streptococci introduces an obvious difficulty into any discussion of their effects, but the conclusion which emerges from the large mass of work done on the subject points to the fact that this group of streptococci are not specific. Any of them may produce any of the lesions. The production of pathogenic effects depends apparently on the host, its previous environment and infections, and on the mode of entry of infecting organisms. In ulcerative endocarditis we are beginning to know some of the factors which turn a transient blood infection with an indifferent streptococcus (an event to which we are all probably subject at any time) into a lethal disease. We know that a very large percentage of the cases occur in patients who are the subjects of previous heart disease, either congenital or acquired. In the other diseases, the predisposing factors may be more subtle and elusive, of the nature of defects in the humoral defences rather than morphological defects, but they are there, and they are the important ætiological factor in the production of the disease. Further, Hitchcock and Swift [10] have shown that indifferent streptococci possess peculiar properties as allergising agents, which are not shown by any other organism. The various organisms in this group show variations

in this property, but it is common to them all in a greater or lesser degree; moreover, the reactive capacity of the inoculated animals varies widely with the same specimen. Derrick and Swift [21 23] have shown further that the hyperergy or allergy produced is not strain-specific and depends more on the method of inoculation than on the streptococcus used, and that in animals states varying from a high degree of immunity to a high degree of hypersensitivity may be produced, and moreover the hypersensitivity may be local.

The conclusion to which one is forced, both from experimental and clinical observation, is that the important factor in chronic streptococcal illnesses depends not so much on the infecting streptococcus as upon its mode of entry into the host, upon the host itself, and its previous experiences with the indifferent streptococci. Such a theory holds out a hope that one day we may be able to deal effectively with the chronic streptococcal illnesses. It is obvious that it is useless to try to deal with such infections on the same lines as those which are effective in dealing with diseases like typhoid or plague. In these infections we are able to a large extent to eradicate the infecting organism, but the streptococci are unfortunately ubiquitous. The solution of the problem lies in a better understanding of bacterial allergy and immunity. When we have discovered the difference between complete immunity, which makes the patient safe, and the dangerous state of allergy or hypersensitiveness, which is apparently a partial or perverted immunity, we shall have discovered the key to the practical treatment of the chronic streptococcal illnesses.

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PRINCE ALFRED HOSPITAL, SYDNEY.—The in-patients admitted during the year ended on June 30th, 1929, numbered 9526, of whom 5916 contributed towards the cost of their maintenance. This number is a record for any general hospital in the Australian Commonwealth. In the year the out-patients rose from 49,386 to 56,657, an increase partly due to the opening of the radium clinic—916 patients presented themselves at this special department. The average residence of in-patients was 20·70 days. At 9902 the number of operations has much more than doubled since 1913. The congestion in the out-patient department is such "that the situation is daily becoming quite intolerable," and the hope is expressed that the new State Hospital Commission will speedily provide the means for erecting new admission and casualty departments. The financial situation is "very much in the nature of a continuous nightmare." The year closed with a deficiency exceeding £53,000, besides an overdraft, guaranteed by the Government, of almost £112,000. The State subsidy for the year was £66,400.

MICRO-ORGANISMS IN PSITTACOSIS.

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HAVING regard to the interest shown in and the numbers of workers engaged on the small and probably short-lived outbreak of psittacosis in this country, I venture to record my findings in this preliminary note. Thanks to the kindness of my friend Dr. G. T. Western, of the Inoculation Department of the London Hospital, I have been able to examine a few films of blood from this disease. Dr. Western at first sent me two air-dried blood films from a woman suffering from psittacosis, dated Feb. 18th, 1930. These I fixed in alcohol and stained in Giemsa for 9 and 30 hours respectively, the stain in the latter case being renewed two or three times. With an entirely open mind I carefully examined these films, step by step, using a one-tenth inch oil immersion objective and compensating ocular 6—i.e., with a magnification of about 600 diameters, looking for the unknown, whether protozoa, bacteria, or virus bodies. After a very exhaustive, and even more exhausting, search of one of these films, extending over 28 hours, I found a few organisms which were definite enough to be suggestive. On examining the second film and looking more particularly for similar organisms, I found a very few quite definite specimens. Subsequently Dr. Western was good enough to send me the following:—

1. Air-dried films made from the blood, spleen, and liver of a hen successfully inoculated with human material on Feb. 25th.
2. Two air-dried films made from citrated blood from a case at Eastleigh, dated March 1st.
3. A small tube of citrated blood from a case at Guy's Hospital dated March 4th. The resident medical officer at Guy's Hospital later kindly sent me blood films from this case, a woman aged 19, on the twentieth day of disease, dated March 12th.
4. Films from heart blood and spleen of a mouse, M.12, inoculated on March 14th from a parrot which died of the disease on the 20th.
5. A small quantity of the filtrate from the spleen of a mouse, M.28, which died, four days after the inoculation, on March 26th. Subsequently Dr. Western informed me that this filtrate was virulent and produced the disease in a mouse.

In all these cases the method adopted was the same. The air-dried films were fixed in alcohol and stained in Giemsa. The citrated blood was centrifuged and films made from the deposit, whilst a small drop of the filtrate was spread on a perfectly clean slide, and when dry these were stained in exactly the same way.

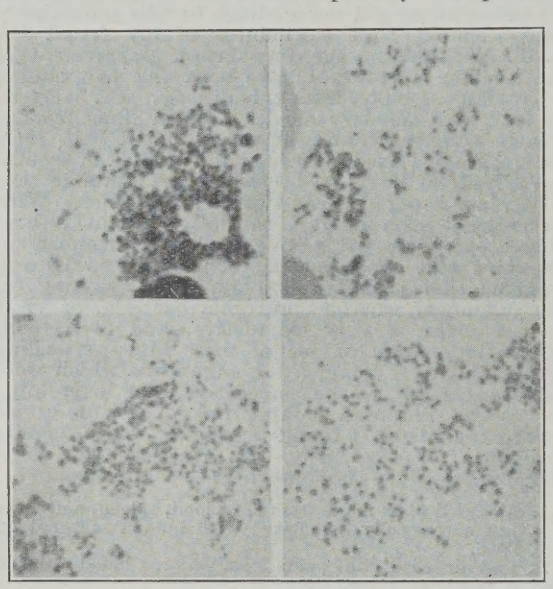
The Organisms Found.

Very similar if not identical organisms were found in all these specimens—viz., minute diplococcoid and coccoid bodies, and in most cases a very few small bacilli or diplobacilli. The most characteristic were the diplococcoid bodies, which consisted of two minute well-defined dots, varying slightly in size and usually staining red with Giemsa. In a few films, especially in preparations made from citrated blood, they stained a pale blue. The average measurement of these paired cocci is about 0·6 to 0·7 μ in length, and about 0·3 to 0·4 μ in diameter. In one of the human blood films two or three ordinary cocci and diplococci were seen, and the contrast in the size and the deep-blue staining of these with the minute, generally red-staining diplococcoid bodies found in this disease was very striking. Isolated coccoid bodies were also seen, but of course they were not as conspicuous as the paired bodies.

The bacilli were very thin rods measuring on an average about 2 μ, very sharply defined, and

usually staining a red colour with Giemsa, but in a few films having a blue tint. On very careful examination of typical examples they are seen to have a division in the centre, so that they apparently consist of two minute bacilli. A few bacilli stained red were found to be somewhat longer, reaching 3 or even 4 μ in length, and some of these showed a beaded appearance. The diplococcoid forms were found in very small numbers in all the cases, but the bacilli were extremely scanty, only three to five being found in a film.

The coccoid and paired coccoid bodies were more numerous in the blood and especially the spleen of



Film from the spleen of an inoculated mouse showing free and intracellular groups of the coccoid *x* bodies of psittacosis.

the hen, whilst in the liver of the hen they were not much more numerous than in the blood. The filtrate from the infected mouse was examined in Giemsa-stained films, in preparations made with Indian ink, and with nigrosin as in Burri's method, and by dark-ground illumination. A very large number of minute coccoid bodies was shown by all these methods, but, as was anticipated, considerably fewer diplococci were present.

Distinctive Bodies in the Spleen of the Inoculated Mouse.

Films of the blood of the inoculated mouse showed relatively numerous coccoid and diplococcoid bodies, and two or three red-stained bacilli were also found. But the films made from the spleen of the same mouse showed the most important and suggestive structures. Here I found not only isolated and scattered coccoid and paired coccoid bodies but, on prolonged search, I came across several groups or clusters of these structures. These agglomerations, which were for the most part lying free, varied in size according to the compactness or otherwise of the granules, and generally measured about 6 to 10 μ in diameter. They stained a peculiar bluish-red colour with Giemsa, and were quite readily distinguished from the very numerous cell granules present. When one-half of a Giemsa-stained film was treated with a drop or two of orange tannin (orange G 1, tannin 5, water 100) for a minute or two and then washed, these small masses were exceedingly well differentiated, and were totally unlike other granules. The groups consisted of fairly closely packed coccoid bodies, single, in pairs, or three or four together. Their outline is remarkably definite, and I find, from photomicrographs taken at a magnification of 2000 diameters, that they measure about 0·25 to 0·45 μ. Mr. Eliot Merlin, by very exact measurements, says that he finds that the smallest range from 0·24 to 0·3 μ, but that many are somewhat larger. Not only are these clusters found free, but some are also seen in the interior of greatly swollen endothelial cells, and their sharp outline, somewhat regular size, and the peculiar staining reaction prevents confusion with the normal cell contents.

To my mind they very closely resemble some of the rickettsia bodies. I compared them with a slide of *Rickettsia prowazeki* of typhus fever in the louse, and they bore a striking similarity to the coccoid and paired coccoid stage of these bodies, but the colour was somewhat different, the rickettsias being bright red (possibly from the fading of the blue of the Giemsa stain, as the film was made in 1922).

The photomicrographs (see Figure) taken at a magnification of 1500 diameters are here reproduced at a magnification of about 2200, and show the distinctive features of the coccoid bodies in clusters from the spleen.

The question which naturally arises is: What is the nature of these organisms; are they accidental, commensal, or secondary invaders, or are they causal? Any speculation about their nature or relationship must be premature at this time, with such limited material at hand, and much more work must be undertaken before a definite expression of any opinion can be given as to the part they play in the causation of psittacosis. I am of the opinion that the small bacilli will prove to be secondary invaders, but that the coccoid and diplococcoid bodies found in the blood of man and infected animals are probably identical with the very characteristic and suggestive groups or masses of these bodies in the spleen of the inoculated mouse. The coccoid bodies are small enough to pass the Seitz filters and have been very definitely found in the filtrate, and these may prove to be the causal organisms of this obscure disease. They might provisionally be termed the coccoid X bodies of psittacosis.

I would here like to express my sincere thanks to Dr. Western for his kindness in sending me specimens.

CÆSAREAN SECTION UNDER SPINAL ANÆSTHESIA.*

BY JOHN WILLIAM BURNS, M.D. DUB., F.R.C.S. EDIN., F.B.C.O.G.,

HON. SURGEON TO THE LIVERPOOL MATERNITY HOSPITAL, AND TO THE LIVERPOOL AND SAMARITAN HOSPITAL FOR WOMEN.

THE obstetrician is always faced with a very difficult problem when called upon to deal with pregnancy and labour complicated by a serious cardiac lesion and weak or failing compensation. There is another type of case which causes considerable anxiety—the patient faced with a complicated labour, who is at the same time suffering from bronchitis or some other respiratory difficulty which would render a general anæsthetic risky. During the past two years I have performed Cæsarean section under spinal anæsthesia on ten patients; seven of these were suffering from advanced cardiac disease with failing compensation, one had severe bronchitis and malpresentation (flying fœtus), and two were cases of contracted pelvis. It is extremely doubtful that any of the cardiac cases would have survived even a simple straightforward labour.

Technique.

No morphia or other sedative is given before the operation. The patient is placed upon the operating table lying on the right side with the knees drawn up and the back arched forwards. One of the lumbar spaces is chosen just above the level of the iliac

* Read before the North of England Obstetrical and Gynæcological Society, April 11th, 1930.

crests. The needle is inserted into the skin just below the midline and on a level with the centre of the space between two lumbar spines. The needle is pushed forwards, inwards, and upwards. It is easier to find the spinal canal by this method than by placing the patient sitting upright. A 10 c.cm. syringe which has previously been charged with stovaine 1 c.cm. is then inserted into the spinal cannula, and an equal quantity of spinal fluid is withdrawn and mixed with the stovaine solution in the syringe. The mixture is then slowly injected. The preparation of stovaine which I use is the stovaine Billen (Chaput formula) put up by Messrs. May and Baker. With this preparation I have not had a failure. After the injection the patient is turned upon her back and the shoulders slightly elevated. Usually by the time the surgeon is ready to operate the patient is anæsthetic up to the costal margin.

The classical Cæsarean section was carried out in all cases and in all the anæsthesia was perfect. The outstanding feature of the operation was the small amount of blood lost by the patient, particularly on incising the uterus, except in those cases where the placenta was situated on the anterior wall. The uterus in all cases contracted very strongly and rapidly upon delivery of the infant. This hypertonic contraction of the uterus associated with spinal anæsthesia has also been noted by Metzger[1] who states that because of this spinal anæsthesia is not advisable for such obstetrical operations as the application of forceps or version.

Most of the patients midway through the operation complained of "feeling sick." Whether this was a symptom of falling blood pressure or to interference with the peritoneum I cannot say. The injection of 0·5 c.cm pituitrin produces relief at once. Sensation begins to return in about one hour and a half and is complete in three to four hours. The first complaint is abdominal pain. There were no post-operative complications of any severity. Severe headache was noted in three cases which persisted for about twelve hours.

In cardiac cases operated upon it was noted that the operation had no appreciable effect upon the patient as far as one could tell from the pulse-rate. All the cases made good recoveries from the operation and were able to leave hospital at the end of three weeks. In all the cardiac cases compensation was to a certain extent restored—i.e., they could get about quietly, the orthopnœa and dyspnœa had disappeared, and they were able to nurse their babies without undue effort. It is a moot point whether these patients should be allowed to nurse the child or not. In my experience I have not found that nursing throws any special burden upon these patients' cardiac condition, I therefore encourage nursing for the first three or four weeks at least. As these patients' families are of necessity limited, it is very important that the infant should be launched upon the sea of life under the best possible circumstances. This can only be brought about by meeting its normal physiological needs in the early days of its existence.

The following is a short account of the cases operated upon :—

CASE 1.—Multigravida, aged 32. Five normal labours and one transverse. Condition on admission : severe bronchitis, cough, dyspnœa. Pregnancy : period 39 weeks ; malposition of fœtus (flying fœtus) reported in THE LANCET, 1928, ii., 751. Termination of pregnancy : Cæsarean section. intrathecal stovaine. Result : uneventful recovery. Abdominal pain two hours after operation, sensation complete in four hours. Lochia red to the tenth day. No headache. discharged fit in 14 days.

CASE 2.—Primipara, aged 23. General condition good. Pregnancy : period full term ; contracted pelvis with marked disproportion. Termination of pregnancy, Cæsarean section. Intrathecal stovaine. Result : uneventful recovery. No headache. Sensation complete in four hours. Discharged fit in 14 days.

CASE 3.—Aged 24, 2-para. One child, Cæsarean section at term. General condition good. Pregnancy : period full term ; contracted pelvis with marked disproportion. Termination of pregnancy, Cæsarean section. Intrathecal stovaine. Result : uneventful recovery. No headache. sensation complete in 3½ to 4 hours. Discharged fit in 14 days.

CASE 4.—Multigravida, aged 35. Three normal labours, one transverse. Rheumatic fever when 7 years old. Condition on admission : fainting attacks, dyspnœa, orthopnœa, pyrexia. Mitral stenosis with very poor compensation. Pregnancy : period on admission 35 weeks. Termination of pregnancy, Cæsarean section. Intrathecal stovaine in thirty-ninth week. Result : operation appeared to have very little affect upon the patient's cardiac condition. Slight nausea during operation. Sensation complete in four hours. Discharged fit on twenty-third day.

CASE 5.—Aged 42, 11-para. Nine normal labours and two miscarriages. Rheumatic fever when 31 years old. Condition on admission : very breathless and distressed orthopnœa, cough, has had two attacks of epistaxis. Mitral stenosis and aortic regurgitation. Compensation poor. Pregnancy : period on admission 33 weeks. Termination of pregnancy, Cæsarean section. Intrathecal stovaine at term. Result : operation no affect on cardiac condition, pulse 76 at end of operation. Slight abdominal pain complained of four hours after operation. Sensation complete four hours, lochia red to the tenth day. Discharged fit on the seventeenth day.

CASE 6.—Primipara, aged 24. Has been in heart hospital for considerable time. Condition on admission : dyspnœa, orthopnœa, cough, mitral stenosis, very poor compensation. Pregnancy : period on admission 37 weeks. Termination of pregnancy : intrathecal stovaine in thirty-eighth week. Result : operation had no affect on pulse-rate. Abdominal pain complained of at end of three hours, sensation complete in four hours. Delusions on third day. Lochia red to tenth day. Good recovery. Discharged fit on twenty-first day. Nursing.

CASE 7.—Aged 24. Condition on admission : dyspnœa, orthopnœa, mitral stenosis, poor compensation. Pregnancy : period on admission 35 weeks. Termination of pregnancy : intrathecal stovaine at term. Result : good recovery from operation. Compensation slowly restored. Discharged fairly well in three weeks. Nursing baby.

CASE 8.—Aged 30. Condition on admission : rapid irregular pulse, dyspnœa, and orthopnœa ; mitral stenosis, poor compensation. Pregnancy : period on admission 34 weeks. Termination of pregnancy, intrathecal stovaine near term. Result : good. Uneventful convalescence. Discharged from hospital in three weeks. Nursing baby.

CASE 9.—Aged 24, 2-para. One premature child and one miscarriage. Chorea when 14 years of age. Condition on admission : marked dyspnœa, orthopnœa, œdema of legs and vulva ; rapid irregular pulse, some cyanosis. Later developed cough. Cardiac lesion : mitral stenosis and some regurgitation ; very poor compensation. Period of pregnancy 30 weeks. Termination with intrathecal stovaine in thirty-eighth week. Result good. Pulse-rate not increased by operation. Uneventful recovery, except that chest was troublesome for about ten days. Compensation only very slowly recovered. Discharged on the twenty-first day fairly well and nursing child.

CASE 10.—Aged 29, 3-para. Two normal labours and one miscarriage. Condition on admission : dyspnœa, cough, cyanosis, and œdema of legs. Mitral stenosis, some auricular fibrillation, poor compensation. Period of pregnancy on admission about 22 weeks Termination of pregnancy : intrathecal stovaine at term. Result : good pulse-rate not affected by operation. Convalescence complicated by the fact that the patient burst all her stitches on the fifth day by coughing. The abdomen was sutured without an anæsthetic. After this the patient made a good recovery. The chest symptoms slowly disappeared and compensation gradually restored. Severe headache was complained of on the second day. Discharged on the twenty-fourth day fairly well.

Conclusions.

Cæsarean section under spinal anæsthesia is an ideal method of dealing with pregnancy complicated by a serious cardiac lesion. The operation in my experience throws no strain upon the heart and in the seven cases dealt with in this note the evidence of shock resulting from the operation was completely absent.

As a method of terminating pregnancy in these cases it is much to be preferred to induction of premature labour or delivery by forceps. It is, in my opinion, very risky to allow a patient with a serious cardiac lesion and failing or poor compensation to undergo the stress of even a simple labour. An added advantage of Cæsarean section is that sterilisation can be carried out at the same time. This is important when the cardiac lesion is a serious one.

It is essential in dealing with these cases that the cardiologist and the obstetrician should work together.

[1] Metzger : Rev. Franç. de Gyn. et d'Obst., January, 1929.

I have been most fortunate in having the enthusiastic help of Dr. John Hay and Dr. Wallace Jones. I am greatly indebted to them for the way in which they have supervised the treatment of the patients while in hospital or rest home.

PROOF OF PATENCY OF A COMMON BILE-DUCT

BY INJECTION OF LIPIODOL.

By W. B. GABRIEL, M.S. Lond., F.R.C.S. Eng.,

SURGEON TO THE ROYAL NORTHERN HOSPITAL; SENIOR ASSISTANT SURGEON TO ST. MARK'S HOSPITAL FOR DISEASES OF THE RECTUM.

Drainage of the common bile-duct after its incision for removal of a stone is now the universally accepted practice. The advantage, in certain cases, of prolonged drainage by the use of a T-tube has been pointed out by Judd and White.[1] The tube can be left in situ for many months if necessary and permits of a free exit of bile. If any serious degree of cholangitis or pancreatitis is present the prolonged rest is very beneficial, and if there is any debris or biliary mud in the common bile-duct regular lavage with saline is easily carried out. When the time for removal of the tube draws near it may be clamped for a number of hours and the effect on the patient observed; if no discomfort results the presumption is that bile is flowing down freely through the short limb of the T-tube.

A recent paper by Ginzburg and Benjamin[2] entitled Lipiodol Studies of Post-operative Biliary Fistulæ suggested to me that with a T-tube in the common duct the patency of the duct might readily be proved by injection of lipiodol before removal of the tube.

A married woman, aged 45, had an operation for acute appendicitis in India during 1926. Later she had a residual pelvic abscess which had to be drained, and in 1927 she had an attack of jaundice.

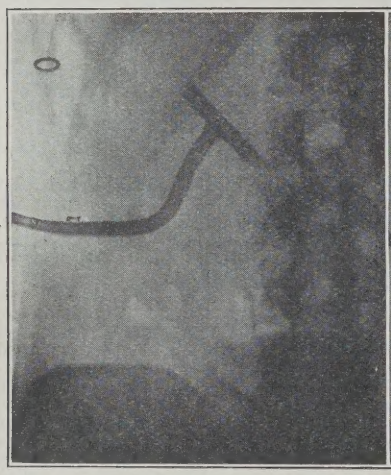
On Feb. 2nd, 1930, an attack of acute abdominal pain began; it was localised chiefly to the right upper quadrant and was accompanied by obstinate constipation. She called in her doctor, Dr. W. C. B. Meyer, for the first time on Feb. 7th, and I saw her in consultation the same day. She then had had severe vomiting for three days, her bowels had not been open since Feb. 2nd, and an enema had been returned clear. Her temperature was 101·6° F. and the pulse-rate 120. Abdominal examination revealed a large tender mass in the right upper abdomen suggestive of an acutely inflamed gall-bladder. In view of the possibility of an intestinal obstruction I advised immediate laparotomy and the patient was transferred to the Royal Northern Hospital.

First operation (cholecystostomy, Feb. 7th).—An incision over the mass revealed a large acutely inflamed gall-bladder with adherent omentum, and flakes of lymph on its surface. The patient's general condition was very bad and her pulse-rate went up to 170 on the table. A cholecystectomy was therefore considered to be inadvisable, and I completed the operation rapidly by emptying the distended gall-bladder of a large amount of foul-smelling pus with a trocar and cannula and stitching in a large-sized de Pezzer catheter with the end cut off. She made a good recovery. The tube was removed on the tenth day after operation. The wound was healing well without any biliary leak until Feb. 27th when she had an attack of vomiting and a copious discharge of bile appeared from the sinus in the abdominal wall. A profuse biliary leak continued and her stools became clay-coloured. An X ray did not reveal a calculus but obstruction of the common bile-duct by a calculus appeared probable.

Second operation (March 14th).—I explored the biliary passages through a transverse incision after infiltration of the abdominal wall with percain solution 1 in 1000. A large solitary oval stone was milked up from the lower part of the common bile-duct and was removed after incising the common duct over it. A cholecystectomy was then performed and the common duct drained by insertion into it of a Kehr's T-tube. Subsequent progress was uneventful. Bile drained freely from the tube which was washed through with saline solution every four hours. On March 21st it was clipped for an hour morning and evening. This caused no discomfort and the clip was gradually applied for longer intervals up to three hours twice daily.

On April 2nd the accompanying radiograms were taken. Fig. 1 shows the tube in position. Lipiodol was then injected and the radiogram shown in Fig. 2 was taken as soon as the lipiodol was seen on screen examination to have reached the common duct. It reach the duodenum very rapidly and proved that there was no obstruction in the distal part of the common duct. The radiogram seen in Fig. 3 was taken about one minute later and shows the left and right hepatic ducts outlined and general diffusion of the lipiodol through the upper loops of the small intestine. On the 4th the tube was clamped continuously for 48 hours without causing any symptoms

Fig. 1.



Showing the T-tube in position in the common bile-duct 19 days after operation.

Fig. 2.

Taken immediately after injection of lipiodol into the tube; the opaque solution has reached the duodenum without delay.

Fig. 3.

Taken a minute later, showing the left and right hepatic ducts outlined and general diffusion of lipiodol throughout the small intestine.

[1] Judd, E. S., and White, R. B.: Collected Papers of the Mayo Clinic, 1928, p. 144.

[2] Ginzburg, L., and Benjamin, E. W.: Annals of Surg., February, 1930, p. 233.

and was removed by gentle traction on the 10th after preliminary injection of morphia and scopolamine.

The biliary fistula was closed in 24 hours and the patient is now convalescent; she is free from symptoms, her stools are of normal colour, and her complexion is clear.

Clinical and Laboratory Notes.

TWO CASES OF INTESTINAL DISEASE IN INFANCY.

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PATHOLOGIST TO THE ROYAL MANCHESTER CHILDREN'S HOSPITAL PENDLEBURY.

THE two following cases of intestinal disease in infancy appeared to be worthy of record, owing, in one case to the rarity of the condition at such an early age, and in the other to the clinical signs and symptoms.

Perforation of a Duodenal Ulcer in a Child of 14 Days.

The patient was a full-time male child (labour and delivery had been normal) who at the age of 12 days began to vomit all his feeds, the vomit being projectile in type, while the bowels became confined. Two days later he was brought to the out-patient department of the Royal Manchester Children's Hospital and was admitted at once as an in-patient, but died a few hours after admission. While in hospital he vomited continuously, the vomit consisting of a deep orange-coloured fluid, evidently containing bile. It was not, unfortunately, examined for blood. The abdomen was very distended but visible peristalsis was not seen.

At the autopsy the following condition was found. The child was an emaciated infant and the abdomen was much distended. The chest contents were normal. The peritoneal cavity was found to be filled with orange-coloured fæces which had even penetrated to the posterior surface of the liver. There was a small, round perforation on the anterior surface of the duodenum one centimetre beyond the pylorus. This perforation was about three millimetres in diameter and fæces were oozing through it. In spite of gentle handling the aperture rapidly increased in size, as though the surrounding wall were very friable. To the naked eye the duodenal wall appeared to be normal and sections also failed to reveal any abnormality. The stomach, pylorus, and the rest of the small intestine were normal. The cæcum was much dilated and filled with fairly solid fæces. The ascending and transverse colon were normal. In the descending colon there was a narrowed portion about two centimetres in length, but fæcal material could easily be squeezed through it. The liver, kidneys, spleen, and pancreas were normal. In the mesentery were numerous small bodies varying up to the size of a hazel nut. They were rounded and pale pink in colour and on section proved to be fibromyomata. The skull presented a suture about 1·5 cm. in width, passing across the frontal bone and reaching almost to the bridge of the nose, and there was much bossing of the frontal bone. The lower jaw was unduly prominent.

Congenital Diverticulum of the Jejunum.

A male child, aged 7 months, was admitted to the Royal Manchester Children's Hospital, Pendlebury, on Sept. 30th, 1929, with a history of vomiting, abdominal pain, and melæna of two months' duration. Examination revealed extreme pallor of the mucosæ and yellowish discoloration of the skin surface generally. The liver was just palpable, but there were no other physical signs. A blood count showed a severe anæmia of a secondary type (red cells, 1,752,000; hæmoglobin less than 20 per cent.; leucocytes, 10,800). During his stay in hospital he vomited once daily, and the stools, with one exception, contained occult blood. On Oct. 12th, 1929, a subcutaneous injection of citrated maternal blood was given into each axilla, but death took place three days later.

At autopsy the child was well formed, rather fat, and extremely pale. The heart and lungs were almost colourless. The liver and kidneys were pale, and the spleen was enlarged and pulpy. A very careful scrutiny of the stomach and intestinal tract failed to reveal the presence of any ulcer or bleeding point. Arising from the jejunum on the mesenteric side was a sac measuring 9·75 cm. in length by 4·5 cm. in width. It was attached along its entire length to the jejunum with which it communicated at the proximal end by an opening 2 cm. in diameter. The distal extremity of the sac was blind and was filled with dark-coloured fæcal material. Sections were not made of the sac wall, but to the naked eye it resembled the small intestine. There was no apparent bleeding point or ulceration within the sac, but as proximal to the mouth of the sac the intestinal contents were pale yellow, and distally they were dark, it appeared that the sac was responsible for the hæmorrhage.

Moynihan[1] collected 13 cases of duodenal ulcer in infants between 6 weeks and 10 months of age. Rogers[2] reported two cases of duodenal ulcer occurring in infants of the same family, but without perforation. Theile[3] collected 264 cases of gastro-duodenal ulceration of which 58 per cent. were duodenal in type. I have failed, however, to find any record of a perforation occurring at such an early age.

I wish to thank Dr. C. P. Lapage and Dr. J. F. Ward for their kind permission to publish the clinical notes of these cases.

LOCAL ABSORPTION OF FAT DUE TO INJECTIONS OF INSULIN.

By L. R. Woodhouse Price, B.A. Camb., M.R.C.S. Eng.

Local atrophy of fat following the prolonged treatment of diabetes mellitus by injections of insulin has been described by Avery,[1] Rabinowitch,[2 3] and Graham and Carmichael,[4] but hitherto no account of the post-mortem appearances has been published.

The opportunity arose in the case of a woman aged 34 years who was admitted to St. Bartholomew's Hospital on Nov. 2nd, 1928, in coma. She developed diabetes mellitus in 1924, and was successfully treated as an out-patient by injections of insulin in doses varying from 5+5 to 20+20 units per day for four months. Thereafter the treatment was continued by the self-administration of insulin and she progressed satisfactorily up to a few days before her admission. She suddenly became comatose and died in spite of adequate insulin treatment.

Post mortem a depressed area was found on the anterior surface of each thigh, in the region of the apex of Scarpa's triangle. This area was about two inches in diameter in each case. A section of the tissues of one thigh was removed, about half an inch in thickness. Macroscopically (see Figure) it shows the absence of subcutaneous fat over a limited local area. The overlying skin is rather whiter than usual, and its surface is slightly depressed. No gross pathological change is evident in the skin or in the muscle of the thigh. Microscopically, the structure of the skin is unchanged. In one part of the section there is no fat intervening between the skin and the muscle, the connective tissue having the appearance of being condensed. No cellular infiltration or indication of inflammatory reaction is apparent.

Sketch of skin and subcutaneous tissue showing absence of fat over a limited area.

It is not known for certain that the patient injected the insulin at these sites, for the condition was discovered only after death. The specimen has been preserved in Kaiserling's solution.

I wish to thank Prof. F. R. Fraser, who had charge

[1] Moynihan, B.: Duodenal Ulcer, London, 1910.
[2] Rogers, J. S. Y.: Arch. Dis. in Childhood, 1928, iii., 163.
[3] Quoted by Hurst, A. F., and Stewart, M.: Gastric and Duodenal Ulcer, London, 1929, p. 28.

of the case, for permission to publish this note on the post-mortem findings, and Dr. T. H. G. Shore, curator of the Pathological Museum at St. Bartholomew's Hospital, for permission to publish a sketch of the specimen.

References.—1. Avery, H.: Brit. Med. Jour., 1929, i., 597. 2. Rabinowitch, I. M.: Canad. Med. Assoc. Jour., 1928, xviii., 560. 3. Rabonowitch, I. M., Ibid., 1929, xxi., 67. 4. Carmichael, E. A., and Graham, G.: THE LANCET, 1928, i., 601.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF UROLOGY.

AT a meeting of this Section held on April 30th, Mr. FRANK JEANS, the President, being in the chair, Prof. HUGH YOUNG (Johns Hopkins University, U.S.A.) gave an address on the advantages of

THE PERINEAL ROUTE

in the treatment of various diseases of the prostate. It was not his purpose, he said, to persuade his hearers that perineal prostatectomy was superior to suprapubic—Sir Peter Freyer and his associates had done so much to show its value. But owing to the success which urologists in England had had with the suprapubic route, it was perhaps not sufficiently appreciated that the perineal route could well be employed for other pathological conditions of the prostate. One reason for the unpopularity of the perineal route in early days was the use of the median incision, the operator plunging his knife through the perineum, cutting through the bulb, with consequent free bleeding, through the triangular ligament, through the external sphincter, and if he were not careful, incising rectum or bladder, when not only serious hæmorrhage but incontinence resulted. Early perineal prostatectomists such as Goodfellow tore or cut through these structures; Charles Mayo devised a method of enucleating parts of the lobes; and consequently perineal prostatectomy came to be associated with a risk of damage and hæmorrhage, and also of incontinence and disturbance of the sexual function owing to interference with the ejaculatory ducts and other delicate structures. In reaching the prostate, his hearers knew the importance of avoiding those structures which early urologists so frequently injured. It was necessary to cut at the back of the bulb and the two transverse peronei muscles, so as not to injure the sphincter. Two layers of fascia seemed to have been put there by Nature to protect adjacent structures; they shielded the rectum from infection, and caused malignant disease to pass upwards instead of through the rectum. As the prostate increased in size the urethra became flattened from side to side, while the middle lobe extended through the sphincter into the bladder, causing obstruction there and giving rise to hypertrophy of the trigone.

One advantage of operating on the prostate through the perineum was the ready production of local anæsthesia by a single injection through the sacral canal. Difficulty if it occurred was due to the patient's position. If a flat table was used no adequate view could be obtained of the field of operation. He showed on the screen a picture of the special table he used; good results, however, could be obtained on an ordinary table by means of sandbags and straps. At a later date the median incision was replaced by an oblique incision to one side, which was found safer and caused less hæmorrhage. It also brought the operator straight into the apex of the prostate, without destroying important structures. Even to-day few surgeons could show a better series of results than some operators had with this method. The operation was based on the triangular ligament and the ischiopubic ramus. After the primary incision the surgeon used blunt dissection on each side of the median raphe, avoiding injury to the transverse perineal muscle. The central tendon was brought into view by means of a bifid retractor. In most cases the prostate was brought out, so that the operator could see what he was doing. It should be palpated and the diagnosis confirmed before proceeding. If the case was one of prostatic hypertrophy, the enlargement could be extracted through a variety of incisions. The median incision would give the same result as the suprapubic; or the incision might be peri-lobular, or bilateral, or in the form of an inverted "V." He had tried every kind and was not yet satisfied as to which was best; the "V" incision opened the part up and made it easy to enter and enucleate the two lateral lobes. Scissors could be used if care was taken to do no injury to tissues which were not pathological and which were to be left behind. In many cases it was possible to follow the aberrant lobules beneath the trigone and to remove them in one piece with the lateral lobes.

Where a previous cystoscopy had showed the presence of hypertrophied tissue in the anterior commissure or the anterior lobe it was desirable to remove the commissure also. That gave the sort of specimen which Freyer nearly always obtained; he broke through the mucous membrane and enucleated the pathological prostate from the outside of its encapsulated fibres, nearly always removing a portion of the anterior commissure and the anterior part of the urethra with it. It could be done in that way through the perineum if the surgeon started from the outside and went round as Freyer did, removing the hypertrophied prostate in one pieee. Most American surgeons who practised suprapubic prostatectomy went through the urethra and did not remove the anterior commissure. If the patient had a very large middle lobe, much less tissue was dragged through the sphincter in the perineal operation.

In the majority of cases, said Dr. Young, he used the bilateral incision, the objection to which was that the hypertrophied tissues or lobes could not be removed in one piece. It was more conservative than the inverted "V," as there was less injury to the urethra; the first cases he did by this method healed up more quickly, and there was less disturbance of the sexual function than in other cases. But there was also less chance of inspection and of being sure that the tissue to be removed had all been taken away. This procedure was advisable for cases of carcinoma which had gone too far to permit of radical operation. In a fair proportion of cases when operating through the perineum the surgeon encountered calculi lying external to the hypertrophied portions and beneath the normal prostate. If such a calculus was beneath the middle lobe, it could be removed through the lateral incision. He had practically never been able to appreciate or remove calculi by suprapubic prostatectomy when they were in that portion of the prostate. Having removed prostate and stone, through an inverted "V" incision, the surgeon was in a position to carry out whatever might be desirable. His present method was, after removing the prostate, to push into the bladder a rubber bag which was then blown up with air or water so as to form a tractor to stop hæmorrhage; a tube in the centre of the bag allowed for drainage. That obviated the need for gauze packing or sutures. But the wound took longer to close, and convalescence was slower.

Causes of Mortality.

Of the immediate causes of death in these cases, the more important were pneumonia and pulmonary embolism. His own mortality-rate, in 1571 cases, was 3·6 per cent. The most serious post-operative complication was embolism which might take place as late as three to six weeks after the operation. It was not known exactly why it occurred, but there was such a risk in all operations below the umbilicus

A careful comparative study by the surgical department at Johns Hopkins Hospital had shown that pulmonary embolism was now more common all over the world than formerly. This was also the view at the Mayo Clinic. Sometimes no lesion was found in the femoral vein, yet in the heart there was a long clot which must have come from it. Possibly posture had something to do with the formation of emboli; certainly sepsis played an important part. Only 8 per cent. of the fatal cases in his series could be attributed to the heart condition. The variation in mortality-rate over 20 years was interesting. At first the operative mortality was 8½ per cent; in the next 66 cases it came down to 5 per cent.; and in the following two years to zero—96 operations without a death. The publication of these results, and the consequent receipt of extreme cases from many places—possibly combined with a little over-confidence—caused the mortality to return to 5 per cent. Again the zero point was reached, and after the war there was another rise. During the last three years, operations including men over 80 years of age, he had had no deaths. It was fair to conclude that the operation per se need not be regarded as a serious one; but in patients of prostatectomy age, any pathological condition might be met with, and there was always necessarily some risk. Not infrequently the vesical orifice was in a condition of fibrosis, especially difficult to remove by the perineal route.

Hypertrophy and Malignancy.

Twenty-two per cent. of men who came to his clinic with symptoms of prostatism had carcinoma, and in many the malignancy was contemporaneous with hypertrophy. Osler had well said that the general practitioner should make himself as adept at examining the prostate per rectum as he was at examining the lungs, and that this examination should be done more frequently. Medical men should be impressed more than they were with what could be gained by early operation in these cases. Too often, by the time the patient reached the urologist the lateral lobes as well as the seminal vesicles were indurated, and there was little hope of a radical cure. In 50 per cent. of cases of carcinoma in his experience there were two lateral hypertrophies and a carcinoma at the back; there seemed, indeed, to be a selective affinity between carcinoma and hypertrophy. Carcinoma, almost in every case, developed in the posterior portion. The cystoscope showed great lobes projecting into the bladder, and the surgeon must not be deceived into supposing that there was present no more than ordinary hypertrophy. He had found that in practically all cases in which there were grounds for suspecting carcinoma, the suspicion proved justified. In suspicious cases the prostate should be exposed, resected, and a frozen section made.

In cases in which the disease had progressed so far that radical operation was impossible, as a rule no operation was needed, because these men were able to urinate. But something had to be done on account of complete retention, a catheter life was apt to prove difficult and painful, and there might be much bleeding. His practice then was to resect the lateral and median portions of the prostate sufficiently to remove the obstruction. He and his colleagues had dealt with about 400 cases in this way, and the majority had continued able to pass water. The procedure had not stayed the onset of the carcinoma, but had given the patients a more comfortable existence than followed simple suprapubic drainage. The perineal route was justified in cases of diverticulum of the posterior urethra which appeared on the surface and the opening of which could be found by means of the cysto-urethroscope. Another condition which urgently required perineal prostatic surgery was the trauma to the posterior urethra, generally at the junction of prostatic and membranous portions, which occurred in fractured pelvis. Recto-urethral fissure also was operable through the perineum. For septicæmic conditions he relied on the intravenous use of arseobenzol or mercurochrome, 25 to 30 c.cm. of a 1 per cent. solution of the latter.

The PRESIDENT thanked Dr. Young for his address, which was illustrated by a large series of lantern slides. There was no discussion.

SECTION OF ANÆSTHETICS.

Mr. R. E. APPERLY, the President, took the chair at the annual general meeting of this Section on May 2nd. After officers had been elected and other business transacted, a paper on

ETHYLENE ANÆSTHESIA

was read by Dr. R. J. CLAUSEN. Ethylene as an anæsthetic had been first mentioned, he said, in 1849 by Thomas Nunnely, a surgeon of Leeds, who had condemned it on several grounds. Its modern use dated from 1923, when Luckhardt, of Chicago, and other transatlantic workers had applied it successfully. It had attained popularity in America and Canada, but not in this country. Dr. H. P. Fairlie, of Glasgow, had, however, had considerable experience, and Sir Francis Shipway and Dr. C. Langton Hewer had both reported favourably on it in 1925. Its formula was C_2H_4; it had no colour but a characteristic and unpleasant smell, part of which might be due to impurities. It was highly inflammable and when mixed with oxygen, air, or nitrous oxide, explosive. It could be used in a McKesson or any other good machine calibrated for nitrous oxide; the oxygen percentage given was theoretically less than with nitrous oxide but actually was unexpectedly large. The cylinders were similar in size but only contained 150 gallons of ethylene as against 200 gallons of nitrous oxide. The valve nozzles had a left-hand thread as a warning of the inflammability of the gas, and therefore required special adaptors in a Boyle's machine; Dr. Clausen preferred the yoke attachment with straight or type 7 valves. He had given 371 administrations, 92 of which had been for dental extraction and the remainder mostly for gynæcological operations. The McKesson apparatus had been employed for practically all. Ages had ranged between zero (represented by five Cæsarean sections) and 84; the longest anæsthesia had lasted 2 hours 25 minutes. Ethylene had proved excellent in pelvic operations in combination with spinal anæsthesia. A few endotracheal applications had been given. The preparation and premedication had followed the ordinary hospital routine; some hypnotic was desirable, and Dr. Clausen recommended gr. 1/6 morphia with gr. 1/100 atropine.

Induction was quick and pleasant, and followed the same technique as with nitrous oxide. It was generally commenced with nearly pure gas, the oxygen percentage being increased slightly after the first few breaths. If the breath were suspended through secondary saturation, pure oxygen would quickly restore it. The time of induction was probably less than with nitrous oxide, and the onset of anæsthesia was quick and sudden with relaxation. The type of anæsthesia was like that produced by nitrous oxide but was deeper and smoother; there was more relaxation and the pulse- and respiration-rates were slower. The oxygen percentage being higher, the colour was deeper, but the signs of anoxæmia were not usually so obvious. The oxygen percentage ranged from fifteen to thirty, the dial showing 10–15 per cent. The consumption of gas averaged about 60 gallons an hour, and of the oxygen about two cubic feet; in hospital this would cost about 3*s.* 3*d.*

Ether had been given as well in nearly all abdominal operations to secure adequate relaxation, but could probably be dispensed with if heavier premedication were used and the induction prolonged. It was more effective with ethylene than with nitrous oxide, and an average of two and a half ounces had been sufficient in a series of operations lasting on an average

82 minutes. It was chiefly useful for debilitated and shocked patients, in the repeated anæsthesias of radium therapy of the uterus, and in hospital dental work.

Recovery from ethylene was nearly as quick as from nitrous oxide, though complete elimination of the gas took much longer. It was succeeded by a long period of analgesia. The patient's condition after a long anæsthesia was strikingly good, and convalescence was equal to that after nitrous oxide. Slight vomiting was common after applications lasting more than a quarter of an hour, but serious sickness was rare, though more frequent than with nitrous oxide. No deaths could be attributed to ethylene, though it had been blamed for the death of one Cæsarean baby with unexpanded lungs.

Its drawbacks were (1) its smell; (2) increased hæmorrhage; (3) risk of fire. The smell could be counteracted by the use of an efficient exhaust pipe; Dr. Clausen used a rubber hose-pipe of about half an inch bore, which could be carried in his case. In hospital a permanent exhaust pipe could be fitted with little trouble. This device produced no ill-effects in the patient, as it only caused a respiratory pressure in the mask of at most half a millimetre of mercury. Another means was a closed circuit with carbon dioxide absorption. Hæmorrhage was not much increased, and some patients bled profusely with other anæsthetics. The risk of fire or explosion was real, and ethylene should not be used near naked lights, cauteries, diathermy, or other sources of heat. Most of the reported accidents seemed to have been due to neglect or to static electricity, a phenomenon rare in this country. There was little risk of explosion with 20 per cent. of oxygen or less. Dr. Clausen only took one precaution, that of putting a little water into the rebreathing bag in order to moisten the mixed gases. To sum up, ethylene might often replace nitrous oxide with benefit, but its drawbacks at present prevented its general use, though it deserved a thorough investigation and trial.

Discussion.

Dr. LANGTON HEWER said that he had found the advantages of ethylene over nitrous oxide to be the deeper relaxation it gave and the higher percentage of oxygen that could be administered. In the laboratory ethylene hardly smelt at all, but when kept for 24 hours it acquired its characteristic acetylene-like smell, which must be due to impurities. If chemists could remove this disadvantage, the use of ethylene would be less unpleasant and might increase. The patient was hardly affected at all. The closed circuit had the drawback that it was difficult to see when the compound in the carbon dioxide filter had become used up, and a rather large container was necessary for a long case. He doubted whether ethylene had any advantages over nitrous oxide with a minimum amount of ether.

Dr. JOSEPH BLOMFIELD had formed a favourable opinion of ethylene from using it on a number of very sick patients in short operations. He had, however, abandoned it because of its detestable smell.

Dr. H. W. FEATHERSTONE asked how long the flexible expiratory tube must be. To move the table towards the window in a modern theatre would introduce complications, and a tube of any length caused back pressure. The smell was the greatest obstacle to anæsthetists who believed in the gas, for it intensified the criticism always levelled at a new method.

Dr. I. W. MAGILL did not regard ethylene as vastly superior to nitrous oxide. He suggested that the exhaust pipe be fitted with a suction motor to obviate back pressure.

Dr. ASHLEY DALY suggested that the death of the baby delivered by Cæsarean section had been probably due to the morphia of the premedication. He objected to a preliminary hypnotic for these operations.

Dr. CLAUSEN, in reply, said that this patient had not had morphia. He used a pipe about five yards long, which led into a corner of the theatre. The increase in back pressure was inconsiderable under ordinary conditions; it was only apt to be at all serious if the patient were straining or coughing or breathing deeply and violently. The smell was chiefly in evidence in dental work, where the exhaust pipe might not be practicable. The percentage purity of the gas was already 99·8, but the manufacturers were experimenting with a view to reducing the smell. Ethylene with a little ether gave better results than nitrous oxide with a fair amount of ether, and there was a definite balance in favour of ethylene.

Reviews and Notices of Books.

MEDICINE IN THE TROPICS.

Recent Advances in Tropical Medicine. Second edition. By Sir LEONARD ROGERS, C.I.E., F.R.C.P., F.R.S., Physician and Lecturer, London School of Tropical Medicine. London: J. and A. Churchill. 1929. Pp. 439. 12*s.* 6*d.*

IN the preface to the first edition of this book Sir Leonard Rogers spoke of the detailed progress in tropical medicine of late years, as opposed to the giant strides of two or three decades ago. The second edition carries us a little further in this gradual advance, but contains no momentous additions. In the new edition a certain amount of material has been omitted to make room for sections on Oroya fever, verruga peruana, helminthic infections, granuloma inguinale, and climatic bubo; additions have also been made to the excellent illustrations. The section on Oroya fever and verruga peruana gives an interesting summary of H. Noguchi's research which has established the identical origin of the two diseases. Working with the *Bartonella bacilliformis* from the blood of a Peruvian case of Oroya fever, he found that he was able to produce both intermittent fever of the Oroya type by intravenous injection, and skin nodules typical of verruga by intradermal inoculation. He found that transmission occurred by the bite of a tick, which explains a local belief that the disease is only contracted by those sleeping in affected areas, and cannot be acquired during a visit in the daytime. No satisfactory treatment of the two modifications of the disease has been found, but salvarsan appears to be of benefit. Sir Leonard Rogers deals with the common tropical diseases in the way which is most likely to be of value to the practitioner who has to handle them—that is to say, he gives prominence to treatment and to those practical points in diagnosis which can be distinguished by an isolated physician in the tropics. Detailed descriptions of laboratory technique are avoided.

The Care of Children in the Tropics. By ERIC C. SPAAR, M.D., M.R.C.P., Physician, General Hospital, Colombo. London: Baillière, Tindall and Cox. 1930. Pp. 265. 7*s.* 6*d.*

THIS book is intended for the use of mothers and young practitioners, and comprises a well-arranged and readable account of the essentials of pædiatrics, with special information on problems peculiar to tropical climates. A chapter which will be particularly helpful to mothers who are unfamiliar with such climates is one on nursery hygiene, containing details of the management both of the baby and the ayah. Considerable attention is devoted to infant feeding, and due stress is laid on the additional importance of breast-feeding under unfavourable hygienic and climatic conditions. In artificial feeding the relative merits of fresh and dried milks have to be considered on quite a different basis to that which arises in England, and, except under special circumstances, the use of dried milks is here advocated. This book

should be a wise investment for any parent who is faced with the problem of bringing up children in a hot country.

Epidemiology and Control of Malaria in Palestine. By ISRAEL J. KLIGLER, Director, Department of Hygiene, Hebrew University, Jerusalem. Chicago: University of Chicago Press. 1930. Pp. 240. 22*s.* 6*d.*

THIS is an extremely well-planned piece of work which is a testimony to the care and industry of Dr. Kligler. Although primarily of local interest, the book contains evidence of extensive personal observation and may be widely read on that account. The chief carrier of malaria in Palestine is known as *Anopheles elutus*, and all the efforts designed to keep it under control are adequately reviewed in this book.

Malarial Nephritis. Epidemiological and Clinical Notes on Malaria, Blackwater Fever, Albuminuria, and Nephritis in the Interior of British Guiana Based on Seven Years' Continual Observation. By GEORGE GIGLIOLI, M.D. Italy, D.T.M. & H. Eng., Chief Medical Officer to the Demerara Bauxite Co., Ltd., British Guiana. London: J. and A. Churchill. 1930. Pp. 164. 8*s.* 6*d.*

THE high incidence and severity of nephritis in the tropics, especially in South America, has given rise to considerable concern and speculation. It has formed the subject of several inquiries and has been widely discussed in recent papers. Dr. George Giglioli, who is well known for his intensive and accurate work at Mackenzie City, has done well to combine in this small book his views on the relation of chronic malaria to nephritis together with his observations on the epidemiology of malaria and blackwater fever in British Guiana. Chronic nephritis, he finds, is not associated with any particular species of malaria parasite. Albuminuria was present in 25 per cent. of 550 cases examined. In benign tertian and quartan malaria the frequency of albuminuria increases with the duration of the infection and its tendency to relapse. In most old-standing cases of malarial nephritis the search for parasites in the blood may be negative. During seven years' observation in British Guiana 56 cases of blackwater fever were observed by Dr. Giglioli, and of these 33 occurred in children below 15 years of age.

The Mosquitoes of North America. By R. MATHESON, Professor of Entomology, New York State College of Agriculture, Cornell University. London: Baillière, Tindall and Cox. 1930. Pp. 268. 25*s.*

THIS is a modest but practical book. The author acknowledges his indebtedness to Howard, Dyar, and Knab for their masterly work on the mosquitoes of North and Central America. His own work has the merit of brevity and clearness. The keys of genera are well arranged and the descriptions of species adequate. Only eight species of anophelines are known from North America and several of these are rare, local, or confined to the more southern parts of the United States. Of culicinæ nearly 120 species are treated and described. The volume closes with nine plates illustrating the hypopygia as a means of differentiation. There are also numerous outline figures of the larvæ and a good index. Altogether a most useful work for students.

STATISTICAL METHODS FOR RESEARCH WORKERS.

By R. A. FISHER, Sc.D., F.R.S. Third edition, revised and enlarged. London: Oliver and Boyd. Pp. 383. 15*s.*

THE statistical problems which nowadays present themselves to the laboratory worker tend to increase in number rapidly, so that it is not surprising that Dr. Fisher's monograph should have reached a third edition within five years. The intention is that use should be made of the book without entering into the mathematical theory of statistical methods, and the methods are here presented in the form of practical procedures, appropriate to the data with which the pieces of research work are actually concerned. None the less a very considerable familiarity with mathematical technique is required for the comprehension of the teaching. Few individual workers in the solution of medical problems are likely to possess the necessary equipment, but it is to the advanced biologist that the manual is directed. He will find the work valuable and the tables at the end to afford convenient assistance.

PATHOGENIC MICRO-ORGANISMS.

Ninth edition. By WILLIAM HALLOCK PARK, M.D., Professor of Bacteriology and Hygiene, University and Bellevue Hospital Medical College, and Director of the Bureau of Laboratories of the Department of Health, New York City; and ANNA WESSELS WILLIAMS, M.D., and CHARLES KRUMWIEDE, Asst. Directors of the Bureau. London: Baillière, Tindall and Cox. 1929. Pp. 819. 30*s.*

THE new edition of this well-known American text-book has been extensively revised. Its matter has been rearranged so that the grouping of the different micro-organisms conforms more closely to the classification adopted by the Society of American Bacteriologists, whose nomenclature has been adopted, though not to the exclusion of the older and more familiar terms. The chapters on the pyogenic cocci, the paratyphoid bacilli and the pneumococci have been practically rewritten. The consideration of the salmonellas is rather scanty and hardly up to the standard expected in this country, whilst a serious omission is the absence of discussion of somatic and flagellar antigens which makes the chapter upon agglutination decidedly out of date. A number of minor errors deserve attention—e.g., the description of the *Streptococcus fæcalis* as a "viridans" organism on page 317; the quantity of serum to be injected intracutaneously in the Schultz-Charlton test is given as 1·0 c.cm. instead of 0·1 c.cm. (p. 329); and Nakayama's description of the process of obtaining fresh active leucocytes (p. 322) is incomprehensible. No mention is made anywhere of rheumatic fever. The book is, on the whole, well balanced and in spite of the increasing collaboration which has gone to its making it preserves much of that personal touch which has contributed so largely to its success.

CLINICAL ATLAS OF BLOOD DISEASES.

By A. PINEY, M.D., M.R.C.P., Research Pathologist, Cancer Hospital, London; and STANLEY WYARD, M.D., M.R.C.P., Physician, Bolingbroke Hospital. London: J. and A. Churchill. 1930. Pp. 99. 12*s.* 6*d.*

THE value of atlases of the blood is open to question. Given an acquaintance with the general principles of pathology and more particularly of the embryology and morphology of the blood, it is possible to make some sort of an intelligent deduction as to the type of blood picture to be expected in any particular pathological condition. For those, however, who have not mastered, or have no aptitude for, general principles, pictorial representation undoubtedly has its value. Thanks to the skill of Mr. J. R. Ford the present volume contains some of the best pictures of blood cells, both normal and abnormal, ever published. The accompanying text is skilfully arranged so as to give in the shortest possible space the outline of the pathology and treatment of the conditions considered. In future issues the authors might place a short descriptive caption below all instead of only below some of the plates.

The book is essentially one for the learner, and could hardly be bettered.

A MANUAL OF ZOOLOGY.

Sixth edition. By L. A. BORRADAILE, Sc.D., Fellow and Tutor of Selwyn College, Cambridge, and Lecturer in Zoology. London: Humphrey Milford, Oxford University Press. 1930. Pp. 683. 16*s*.

THIS book has primarily been written for university students starting zoology. It is deceptively small and contains an immense amount of reading matter with numerous illustrations. The first chapter is an introduction to the living organism in which the author endeavours to give, in an elementary form, the principles of metabolism and the biochemistry of life. Differences between the animal and vegetable kingdoms are also dealt with. The next four chapters are devoted to the anatomy, histology, and physiology of the frog. The subjects are dealt with simultaneously and in some detail, yet very concisely. In fact, the matter is so condensed that a beginner might hardly be able to cope with the material put before him. The protozoa are then described; the amœba, paramecium, and vorticella receiving the most attention. There follows a chapter on protozoa pathogenic to man, the transmitting agents being briefly mentioned. The various phyla of the metazoa are then considered systematically, representative members being described in each case. In connexion with the nematodes, parasitism receives special consideration. Following upon the systematic zoology is an introduction to embryology, a classification of the animal kingdom, and an introduction to evolution. The final chapter is an introduction to animal ecology. The book concludes with an appendix indicating a course of practical training.

The book should be of value to university students doing first and even second year zoology. In particular it should appeal to medical students, for references to pathogenicity are abundant.

THE FEMALE SEX HORMONE.

By R. T. FRANK, A.M., M.D., Gynecologist to Mount Sinai Hospital, New York. London: Baillière, Tindall and Cox. With 86 figures in the text. Pp. 321. 25*s*.

THIS monograph differs from another upon the same subject by A. S. Parkes recently reviewed in THE LANCET mainly because the author is primarily interested in the clinical aspects of gynæcology: an attitude which will commend itself to many of our readers. Unfortunately, however, the clinical side is also in many respects the more elusive, depending as it often does upon subjective evidence, and therefore needing even greater care and caution in its presentation. These virtues are not particularly noticeable in this monograph, either in the first part dealing with the biology, pharmacology, and chemistry, or in the second part concerning clinical investigations based on Dr. Frank's test for the hormone in the blood; many statements are made with a confidence which the reader may not share. Considering his 25 years of laboratory and clinical research Dr. Frank's own work may reasonably be expected to fill a considerable part of this volume; but the personal element may seem a little too prominent for a book which has the external appearance of a general survey of the subject. Statements based upon personal experience only, and even contrary to generally accepted opinion, are put forward without reference to opposing views. For example, the criticism of the water-soluble forms of the female sex hormone that "the rapid deterioration of such solutions bars their effective clinical use" is mainly based upon the author's tests of a number of supposedly active watery preparations, no evidence being given that the batch of material tested was active at the outset. But among the results of assays presented with admirable candour by Dr. Frank there is no example of a preparation found to be highly potent which showed rapid subsequent deterioration. The author's comment upon the Aschheim-Zondek test for pregnancy—that the test is unworkable since the immature mice die long before the completion of the test—has been disproved by several investigations during the past year. Such statements detract from the value of the book, which is to be regretted, since Dr. Frank's experience permits him to present an interesting case for the use of his own test for the diagnosis of pregnancy and for certain ovarian disorders, based upon the estimation of the amount of œstrus-producing hormone in the patient's blood. This section occupies about 120 pages compared with 149 pages dealing with biology, pharmacology, and chemistry. In his foreword the author comments on "this much desired and sought for hormone, which is bound to relieve many of the ills from which women now suffer." Is it really certain that administration of the œstrus-producing hormone will have this result on human patients? Clinical investigations have as yet been relatively few, and though encouraging results have been reported with admittedly active preparations, it seems doubtful whether they justify such optimism.

RHEUMATISM.

A Study of its Nature and Cure. By CHARLES E. SUNDELL, M.D., M.R.C.P. Lond., Senior Physician to the Seamen's Hospital, Greenwich; Consulting Physician to the Evelina Hospital for Children. London: Southern Libraries, Ltd. Pp. 88. 4*s*. 6*d*.

THERE is little that is new, but much that is useful in this little book; it has the merit of being short and easy to read. Several paragraphs are devoted to the diagnosis and treatment of chronic backache, a common and depressing complaint which at present does not receive sufficient attention. In the early part of the work the author defines what he considers to be the fundamental abnormalities in rheumatism and these defects he attacks logically and thoroughly in the section on treatment.

COLPORRHAPHY AND RHEUMATISM.

Recent Work on Colporrhaphy, Rheumatism, and Coli Bacilluria. Second edition. By E. HESKETH ROBERTS, F.R.C.S. Edin., M.D., B.S. Lond., Gynæcological Surgeon, St. John's Hospital, Lewisham. London: H. K. Lewis and Co., Ltd. 1930. Pp. 32. 3*s*. 6*d*.

THE first part of this little book deals with recent work on colporrhaphy, and will be of real value to those who perform this operation. The method of procedure is discussed in detail and is clearly illustrated by numerous diagrams. The second part of the book is concerned with rheumatism and its relation to the perineal conditions for which colporrhaphy is performed, and coliform bacilluria. This section is too indefinite to be useful; an ill-defined disease is blamed for a vague collection of symptoms. Contrary to the author's belief, coliform bacilluria is a recognised source of infection in chronic rheumatism.

X RAY INTERPRETATION.

Elements d'interprétation radioscopique et radiographique des poumons. By Dr. LÉON SCHEKTER (de Boulogne-sur-Mer). Paris: Gaston Doin et Cie. 1930. Pp. 94. Fr.12.

IN this little book Dr. Schekter gives a brief description of X ray shadows produced by the different diseases of the lungs. It is now recognised that considerable disease and even a large tumour may exist in the lung without any physical signs, though the lesion is quite obvious on X ray examination. The interpretation of X ray shadows is, however, a matter of great difficulty, and it is not uncommon to find a patient condemned as consumptive because of shadows which are within normal limits. It is, therefore, as dangerous to overrate as to underrate the value of X ray examination.

This volume will be found useful by the practitioner who has not the time to study the larger text-books on the subject, for though the descriptions of the various conditions are very brief, there are many references to authorities where more detail can be found on any special point.

THE LANCET.

LONDON: SATURDAY, MAY 10, 1930.

PRESENT-DAY EFFECTS OF WAR STRAIN.

COMPLAINT is made by the writer of a letter in the *Daily News* that, when what he calls some wretched derelict of the war is brought before a judge and pleads a war wound or strain of war as an excuse for his trouble, a common judicial retort is that the war is a long way off and such excuses no longer serve. Such incidents do occasionally occur, and illustrate the need, referred to in a recent leading article, of the psychological examination of offenders, for at present the only course open to a magistrate who takes the plea seriously appears to be that of remanding the prisoner to await a report from the prison doctor. Those engaged in the treatment of war neurasthenics often meet with men who, after having fallen into the hands of the police, expressed gratitude for the way they had been understood and handled, and it is gratifying to know that both police and prison officials are ready to give help when they recognise that help is needed; but the cases under discussion indicate the absence of regular machinery to ensure that recognition, and the summary dismissal of the defendant's plea may not only involve injustice but seriously and detrimentally affect a genuine sufferer, whilst even the prison doctor to whom he might be referred may not possess the knowledge of psycho-pathology necessary for the understanding of his mental state.

Setting aside for the time, however, the problem of psychological assistance in court procedure, we may ask whether the mental results of war stress are now a closed book or whether any considerable number of men are still suffering from them. There are still thousands of men drawing pensions for these results, and the Ministry of Pensions maintains homes where the worst cases can find a refuge, but apart from these recognised cases it is impossible to do more than guess at the prevalence and effect of disability due to war stress. Of its victims the more fortunate have overcome their difficulties and found satisfaction in life, others are holding inferior positions through inefficiency, and some have become hopeless derelicts. Employers soon became chary of employing men who had been invalided for neurasthenia, and their attitude is understandable when we realise that under that vague diagnosis are hidden changes in the personality that render the sufferer emotionally unstable and unreliable as a worker. Public attention and sympathy are no longer directed towards the neurasthenic ex-Service man, and it is to be feared that he often meets the fate that comes upon victims of a disorder likely to be described as neurotic and offering no opportunity to ordinary therapy.

Reports of suicides often mention changes of behaviour attributed to war service, though definite medical evidence is rarely sought—perhaps because such changes are still felt to be outside the sphere of clinical medicine; and only by reading between the lines is it sometimes possible to form an opinion as to the nature of the case. Those who pay special attention to the psychoneuroses certainly still meet with patients whose symptoms are related to war experience, and it has been claimed that it is possible to demonstrate the process of suppression, characteristic of the war cases, as still active in ex-Service men who present nervous symptoms, whether supposed or not to be due to war strain. There is, then, no doubt that the nervous sufferer from the late war is still with us. The fading away of emotional public interest in his troubles is not entirely to be regretted, for deteriorative character changes often led a man to take advantage of the emotional appeal rather than coöperate in efforts at rehabilitation. He who complained least often suffered most, for, in spite of a common belief to the contrary, the patient suffering from mental troubles, such as marked many of the war cases, tends to keep them to himself. It is to be hoped that emotional interest will not be replaced by the neglect that in the past was associated with ignorance of psycho-pathology; indeed, there is less danger of that neglect for the very reason that the war itself gave a great stimulus to the study of the minor psychoses. We know now that the war cases differed only superficially from cases, equally serious, that occur in civil life; apart from the help given him by the Ministry of Pensions, the war sufferer must stand or fall with his fellows who have never had the right to claim that help. The plea of war strain in our courts thus becomes only a special example of the need for an organised method by which all relevant information about an offender should be placed at the service of those called upon to pronounce judgment upon him.

END OF THE POOR-LAW IN SCOTLAND.

ON Thursday next Scotland's particular Local Government Act comes into force and the poor-law functions of parish councils pass over to the town councils of the large burghs. The zeal and care with which the parish councils have discharged the duties of their last year in office is commended in the first report which has been put out by the new Scottish Department of Health.[1] One of their chief problems of late years has been the relief of able-bodied unemployed, which still calls for anxious consideration of individual cases. In 1921 parish councils were empowered to grant relief to able-bodies persons who were unable to find employment. This was intended as a temporary measure, but the difficulties which have arisen out of it make the remedy almost as unsatisfactory as the problem. Later Acts which empowered the councils to coöperate with other local authorities in providing relief work for these men, or to assist them to emigrate with their families, can only be of value in a few cases while the number of able-bodied unemployed remains so large. Unconditional financial relief, although tending to preserve the standard of health, may lead to a habit of idleness which is injurious alike to the man's physique and his morale. The refusal of all relief except residence in a poor-law institution is not a satisfactory measure, since if relief is accepted the man is no longer in a position to seek work, and if he is genuinely unable to find employment refusal to accept indoor relief will leave him destitute. If relief is refused to a man because of prolonged unemployment, but granted to his family, the result is that he shares, as a rule, in relief which was not intended to suffice for a whole household. Again, a man who has made serious attempts to find work resents being forced to share institutional life with those who have been refused outdoor relief on the grounds of bad character. In Glasgow during the past year employment

[1] First Annual Report (1929) of the Department of Health for Scotland. Cmd. 3529. H.M. Stat. Office. 1930. Pp. 220. 3s. 6d

was found for a large number of men on a new mental defective institution, the aliment which they would otherwise have received as outdoor relief being contributed to the District Board of Control which was erecting the building. Men unemployable in the present state of the labour market, either through mental or physical defect or through depraved habits, represent an even more serious difficulty. It is customary to offer only indoor relief to these cases, but their presence in the institution is a source of discomfort to the other inmates, and certainly does not simplify administration. It has been suggested that labour colonies are required for the reform or training of such persons.

Unemployment in Scotland remains high and has increased since 1928; during 1929 the average number of unemployed represented 12·3 per cent. of the insured population. In 1927 and 1928 the corresponding figures were 10·1 and 11·6 per cent. respectively, and there has been a real as well as a relative increase in the numbers. In the coal-mining industry there was improvement as compared with 1928, but in shipbuilding unemployment remained high; in marine engineering unemployment was below the general average. Certain industrial areas show marked improvement, Clydebank, Greenock, and Port Glasgow being among them. Vagrancy has increased of late years owing to movement about the country of men in search of work. Applications for relief are made to inspectors more especially along the main roads, so that the burden on parish rates is unequally distributed. Often there is no poor-law institution for 30 miles or more, and construction of shelter houses may become necessary. Unfortunately a taste for tramping appears to grow on those who pursue it indefinitely; many able-bodied young men appear to prefer the life of a tramp, picking up occasional odd jobs, to the monotony of steady employment. GEORGE BORROW and W. H. DAVIES in their defences of vagrancy might have spared more sympathy for the mournful lot of the ratepayer, who, besides drudging through the daily round, must maintain the road which the tramp wears out, and if necessary must subsidise the tramp as well. Not uncommonly, in a Scottish parish where an arrangement is made by the council with a householder for sheltering and feeding vagrants, the tramp will ask for another egg and offer to pay for it himself. One of the tasks of the new authorities will be the provision of better institutional accommodation. At present it is not uncommon in Scotland to find acutely sick persons, chronic invalids, senile poor, young children, able-bodied poor, vagrants, mental defectives, and lunatics all in the same institution; the disadvantages of such a system, especially for young children, cannot be too strongly emphasised. The imminence of local government reform has deterred parish councils from undertaking extensive building during the past few years, but the new régime will call for the provision of more satisfactory accommodation.

CALCIUM AND PHOSPHORUS.

KNOWLEDGE of the part played by calcium and phosphorus in the metabolism of the human body has greatly increased during the last ten years and the practical value of this knowledge is beginning to be recognised. But most medical men still have but a dim appreciation of what has been ascertained, while a few have been able to grasp its value in one direction or another. Where new territories are being explored and defined, it is difficult for those who are not engaged in the work, difficult even for those engaged in it, to see its significance and to estimate its value to mankind. Our readers, therefore, will welcome the full and careful review in Dr. DONALD HUNTER'S Goulstonian lectures, of which the third and last appears in THE LANCET this week, and especially the indications he has given of the practical value to clinical medicine of the recently acquired knowledge. On the metabolic processes that concern calcium and phosphorus depend the efficient formation of the bony structures of the skeleton, and that balance of the ions in the body which controls the acid-base reaction of tissues and fluids, the mechanism of the heart-beat, the contractility of plain and striped muscle, the activity of neuromuscular junctions and synapses, and the irritability of muscle and nerve. That the metabolic processes that concern calcium and phosphorus should be correctly performed depends on the ingestion of these elements in sufficient quantities, on their absorption by the digestive processes, on their storage in the skeleton so that they may be readily available when required, and on their presence in the tissues and body fluids in the necessary concentrations and in the necessary physical forms so that they may be available for the biological needs of the tissues and organs. These manifold requirements and functions depend, also, on the integrity of a mechanism in which an accessory food factor, vitamin D, the internal secretion of the parathyroid glands, and an enzyme called phosphatase, play their parts. Phosphorus functions in the storage and utilisation of carbohydrates, and since calcium is stored in the bones as calcium phosphate and phosphorus must be set free with calcium when the stores of the latter are drawn upon, phosphorus metabolism is as important as that of calcium, and the one cannot well be considered apart from the other. It is a long chain of cause and effect. Studies of this nature, whether in human beings or in experimental animals, are necessarily complicated and difficult. Much information is obtained by ascertaining the amount of calcium and of phosphorus in the blood, but in view of the enormous capacity of the skeleton for storage such estimations are indicative merely of the quantity of these elements available for the tissues generally; estimations of their intake and output over a considerable number of days are needed before the loss or gain to the body as a whole can be deduced. Part only of the calcium in the blood is diffusible and able to pass into the tissues and tissue fluids, and of this diffusible calcium a part only is ionised and available immediately for biological processes. The methods for the estimation of these different fractions are not yet satisfactory, and the estimation of the total calcium of the serum, which is the method of study in general use, does not necessarily give the facts that are required. Improved methods of blood analysis may be expected to lead to important further advances. Dr. HUNTER shows clearly that histological study of the bones is required in addition to biochemical study before the disturbances of calcium and phosphorus metabolism that occur in disease can be accurately gauged. He has had the help of Prof. H. M. TURNBULL in the minute examination of bony structures, and their results are good evidence of the productiveness of such coöperation.

Of the applications to clinical medicine none is so dramatic as the recognition of the effect of hyperactivity of the parathyroid glands on the skeleton. The isolation from the parathyroid glands by J. B. COLLIP of a substance that produces on injection a rise of calcium in the serum with increased excretion by the kidney, and the recognition by HUNTER and AUB

that injections of this parathyroid extract cause a loss of calcium from the bones, are important steps in deciding that in certain cases of generalised osteitis fibrosa the diminished density of the bones, the high calcium content of the serum, and the increased calcium excretion point with certainty to a lesion of the parathyroid glands. A number of cases have been recorded in which an incision in the neck has revealed a parathyroid tumour, after removal of which the patient at once improved, the calcium content of the serum fell, and the bones became more dense. In exophthalmic goitre the density of bone is diminished and the excretion of calcium greatly increased, but in these cases the level of calcium in the blood does not rise—why we do not yet know. Prof. TURNBULL's observations on the histology of the long bones make it clear that both in exophthalmic goitre and in hyperactivity of the parathyroid the diminished density of the bone is due to lacunar resorption by osteoclasts and is quite distinct from the diminished density seen in rickets and osteomalacia in which less calcium is laid down in the osteoid tissue. In striking contrast to the condition of hyper-parathyroidism is that seen when the parathyroid glands have been partially removed or damaged during the operation of thyroidectomy. Tetany may then result, associated with low calcium and high phosphorus contents of the blood, and can be relieved by the injection of Collip's parathyroid extract. Tetany may also occur in osteomalacia and some cases of rickets, where the calcium content of the serum is low; but in these conditions it is not advisable to inject parathyroid extract, for this would cause withdrawal of calcium from the bones, which are already poor in calcium salts. Instead the underlying disturbance must be treated, when the calcium content of the serum will rise and the tetany will be relieved. In rickets and osteomalacia the changes in the minute structure of the bones have long been known to be similar, but it is only recently that many workers in many lands have contributed to show that in both the changes are due to the same cause—namely, a deficiency of vitamin D—and that the ingestion of irradiated ergosterol or exposure to sunlight can cure both conditions. In both the phosphorus content of the plasma is low; in osteomalacia the calcium content of the serum is also low and tetany is common; but in rickets the calcium content may be normal and tetany is not common, being only seen in those cases in which the calcium content also is low. In renal rickets the phosphorus content of the plasma is raised and the calcium content lowered, probably as a secondary result of the high phosphorus content, and tetany is frequent.

Estimations of the calcium and phosphorus content of the blood have, therefore, considerable value in diagnosis, and Dr. HUNTER has included in his third lecture a valuable table showing the results of his estimations in typical cases. He discusses other diseases of bone, and indicates how estimations of the phosphatase content of the plasma may lead to important advances. Little is known of the ætiology of osteitis deformans, but H. D. KAY has shown that phosphatase is always in excess in the plasma in this disease. AUB, HUNTER, and others have shown that lead, mercury, arsenic, silver, and radium follow calcium very closely in their behaviour, both as to storage in the bones and elimination. This experience has already been applied in the treatment of lead poisoning and should help us to understand the mechanism of metallic poisoning in general and how to deal with it. Stiff-sickness of cattle is associated with abnormal development of the skeleton, and the investigations of THEILER have shown it to be an osteomalacia of the low-phosphorus type, curable by the addition of phosphates to the diet; similarly, milk-fever of cows is associated with a low calcium content of the serum and can be successfully treated by calcium injections. Accuracy of knowledge leads surely to success in treatment, and Dr. HUNTER's comments on the disappointing results of the administration of calcium in disease deserve the attention of clinicians. The stores of calcium in the body are large and it is usually, he says, the regulating mechanism that is at fault, not the supply. From this it follows that the use of cod-liver oil, ultra-violet light, irradiated ergosterol, parathyroid and thyroid extract may have greater value than the administration of calcium. These are but examples of the way in which our increasing knowledge of calcium and phosphorus metabolism may be applied in human and veterinary medicine, curative and preventive. They illustrate well the progress which is made when the clinician invokes the aid of biochemistry and of pathology and applies their methods to the solution of his problems.

Annotations.

"Ne quid nimis."

WELFARE OF THE BLIND.

THE eighth report of the Advisory Committee on the Welfare of the Blind [1] follows on the lines of its predecessors. According to the latest returns there are 20,149 registered blind persons between the ages of 50 and 70 in England and Wales, and 86 per cent. of these are in receipt of pensions provided for in the Blind Persons Act of 1920 at a cost of £437,900 per annum. The committee thinks the reduction of the age limit from 50 to 40 would be fully justified, but they do not consider how this suggestion, if carried out, would affect those of the blind who have been trained for remunerative employment at an earlier age. Schemes for promoting the welfare of the blind have now been adopted and put into operation by all the 146 local authorities concerned under the Act of 1920, at a cost of £326,799 (1928–29), about one-third of this sum being allocated to assistance to unemployable blind on whom between two and three times as much was spent as was the case two years before. Most of this money has been distributed through voluntary agencies, who have also received direct grants from the Ministry of Health to the extent of £120,000 (1928–29). With regard to the future, the Local Government Act of 1929 changes the system of Government grants, but the committee sees no reason to fear that the amount available for assistance to the blind will be less than heretofore. Indeed, it is hoped that the Act, as finally passed, will considerably strengthen the position of voluntary agencies.

The total number of the registered blind in England and Wales in 1929 was 52,727. Infantile blindness accounts for only a small proportion of this total. The number of registered blind under the age of 5 was 258, or 0·5 per cent. of the total of all ages. We suggest that this figure is wholly unreliable as representing the actual proportion of infantile blindness, and that the vast majority of blind infants are not registered as blind until they become inmates of a blind school after the age of 5. The main causes of infantile blindness are ophthalmia neonatorum, congenital syphilis, and various congenital conditions, including congenital cataract. In an examination of 250 pupils and workers at the Swiss Cottage Blind School in 1927 it was found that out of 180 who had a degree of blindness coming under the definition accepted by the Ministry of Health, as many as 102

[1] H.M. Stationery Office. 1930. Pp. 34. 6*d*.

owed their blindness either to ophthalmia neonatorum or to congenital malformations, including cataract, all of whom must have been blind within the first six months of life.[2] That over a third of the cases of blindness dating from infancy in the whole of England and Wales should be collected at a single institution in London, which is by no means unique, is not at all likely, and we should like to be told exactly how the registration of the blind is effected. It may be added that previous reports of the same committee in 1926 and 1928 have contained similar figures of the proportion of the blind under 5 years old, and in criticising both these reports we had to make exactly the same complaint. The 1928 report also contained figures showing that the percentage of the blind who became blind under the age of 1 year compared to the total number of blind was 17·4 in the year 1927—a fact which is itself a sufficient refutation of the percentage of 0·5 for the proportion of blind existing at that age; for although the proportion of blind from ophthalmia neonatorum has been decreasing to some extent of late years the decrease has not been phenomenal to such an extent.

We regret to observe that in this report there is no reference to the partially blind children who, being too blind to benefit by education in ordinary schools and yet not blind enough to qualify for the special privileges conferred on those termed blind by a somewhat arbitrary standard, are at present apt to fall between two stools. In 1926 the committee expressed the hope that "it would be possible for the Board of Education to proceed with their full programme for the development of extended facilities for the education of this class." In 1928 the report commends the same problem to voluntary enterprise, but as yet we know of no progress in either direction.

In the past the reports of the committee have been largely devoted to the methods of training the blind in remunerative employment. The present one lays stress on the more numerous class of unemployables, in whose interest they have issued a special report to the Minister containing recommendations for financial and general betterment.

RESEARCH INTO BREWING.

FOR many centuries malting and brewing were empirical arts, but in later years these industries, in common with others of long standing, have adopted scientific principles for the methods underlying their practice. The nature of certain investigations carried out by the Institute of Brewing, and still in progress, is described in a memorandum recently issued by the Institute, and from this document it is evident that the various researches are of considerable magnitude, and well meriting the free assistance that is being given to their conduct by members of agricultural institutes and by industrial firms in this country and elsewhere. The work includes the development of new varieties of barley, the investigation of different agricultural conditions such as manuring, the breeding, manuring, drying and packing of hops, methods for overcoming the attack of "downy mildew," and the determination of antiseptic value. In connexion with yeast the work has been mainly directed to the assimilation of various nitrogenous materials by this fungus, whilst experiments on its nutrition are still in progress. Many interesting and valuable results have already been obtained, and whilst the knowledge gained will be of value to the brewing industry the inquiries are of such a fundamental nature that they cannot fail to be of service to the community at large. Pharmacology may also profit, for barley and yeast are the raw materials from which valuable medicaments such as malt extract and nucleic acid are derived. Moreover, the use of hops was a prominent feature in old pharmacopœias.

[2] Thompson, A. Hugh: THE LANCET, 1927, i., 1075.

MEDICAL ANNUALS.

THE *Medical Annual*[1] suffered the loss of its founder and first editor, Dr. Percy Roberts Wilde, in April of last year. The success of his scheme to help the general practitioner to keep up to date must have gratified Dr. Wilde, for since he initiated the first issue in 1882 the annual has grown at first in size and then in prestige until it has become almost indispensable. In 1905 its format was altered, and since then it has not been allowed to expand. The task of editing a summary of current medical advances entails nice judgment and great labour, and though of late years Dr. Wilde had relinquished much of the responsibility, he continued until his death to take a share in the preparation of the *Medical Annual*. The 1930 volume contains articles by recognised authorities on the research and practical experiment of the year, and the editors, Dr. Carey F. Coombs and Mr. A. Rendle Short, review the contents in their introduction. An article by Dr. Ivor J. Davies on the liver treatment of pernicious anæmia deals at length with prognosis, which can, of course, be estimated better as the years pass. One of the secondary effects of the treatment is a rise in the price of raw liver, so that patients find difficulty in obtaining a steady supply. This depends partly on the promiscuous liver treatment of all manner of ailments, a craze which requires correction if cases of pernicious anæmia are to enjoy the benefit of this diet. The value of other foods in this disease, such as kidneys, apricots, and peaches are mentioned, but it is emphasised that these, like liver, only stimulate the development of red cells and have no effect on the underlying pathological process, whatever it may be. The clinical experiments devised by Dr. W. B. Castle to elucidate this process are mentioned in this excellent survey. The intramuscular injection of liver extract as a treatment of high blood pressure is discussed in an article by Dr. A. G. Gibson; the method has been examined by Althausen, Kerr, and Burnett, and appears to cause a temporary fall in pressure, without, it is claimed, any adverse effects. The rationale of the treatment is not discussed. An interesting but depressing section is that on pain in the lower part of the back by Prof. E. W. Hey Groves. After shattering the old theory of pelvic disease, grudgingly conceding arthritis, doubting the existence of sacro-iliac dislocation apart from severe trauma, and moodily holding the scales for strain of the sacro-iliac joint as a cause, Prof. Hey Groves confirms the obscurity of the outlook by a warning against acceptance of anatomical deformity, radiographically discovered, as the basis of any symptom-complex. There is a helpful paragraph on the differential diagnosis of sacro-iliac and lumbo-sacral strains and sprains, especially useful in view of Mr. Riches's experience that the former alone react favourably to manipulation,[2] and a short reference to the work of C. E. Ayers on lumbo-sacral backache due to compression of the fifth lumbar nerve. The paragraph on the treatment of these conditions is brief and pessimistic; the article is well illustrated with X ray plates and a diagram of the fifth lumbar root. A section on the treatment of burns and scalds, by Sir William I. Wheeler, gives an excellent description of the tannic acid method, which is now extensively used for severe burns. Application by means of an atomiser is recommended. It will be remembered that spraying is repeated until a leathery coagulum is formed which protects the injured surface and prevents toxic absorption; the coagulum begins to separate after about a fortnight, and leaves either a healed epidermis or a healthy granulating surface. Sepsis occurring beneath the coagulum sometimes gives rise to trouble, and may require the removal of a part with scissors to allow of the escape of pus. A warning is given against the use of vaseline or moist

[1] Bristol: John Wright and Sons, Ltd.; London: Simpkin Marshall, Ltd. 1930. Pp. 650. 20s.

[2] THE LANCET, May 3rd, p. 957.

dressings to remove the coagulum, lest the toxin previously imprisoned should be released by solution. The annual is arranged alphabetically and is excellently illustrated; the decision to keep it to a size convenient to handle has had the further advantage of ensuring a careful selection of material and its limitation to what is of practical interest.

L'Année Médical Pratique,[3] which attempts to fulfil the same functions in France, is a more modest volume, and the absence of illustrations other than the most diagrammatic make it less attractive. It also provides a survey of the year's work by various authorities. The sections are on the whole briefer, and view the subjects from a different angle. For example, liver treatment of anæmia associated with nephritis is discussed; the view is put forward by C. Lian that the anæmia is much improved in these cases by liver, and that the nitrogen retention, far from being augmented, is decreased. In a case described by Marcel Labbé, however, though the blood count was increased, the blood-urea also continued to rise. The articles are perhaps too brief to give a comprehensive survey of the year's advances; the editors might consider enlargement of the volume as a possibility in the future. Both the English and French annual include a list of preparations, chiefly proprietary, which have come into use during the past year, with a short description of their composition and advantages.

IMMUNISATION AGAINST FILTRABLE VIRUSES.

MUCH attention is now being paid to prophylactic immunisation against those disease agents which we group together under the term "filtrable viruses." Not very long ago it was accepted almost as axiomatic that no immunity could be obtained against these viruses without the production of lesions, but recent research has shown that this is not true. The independent observations of Vallée, Carré, and Rinjard in France, and of the British Foot and Mouth Committee, show that if the virus of foot-and-mouth disease is inactivated with low concentrations of formalin it still retains the power of conferring immunity, whereas its antigenic power is entirely lost on inactivation by heat. This principle has since been applied to other viruses—among them those of distemper and yellow fever—and prophylaxis against distemper along these lines has been practised in the field with success. Whether the formalised vaccine is dead or merely attenuated is still in dispute, but whichever view be correct, it must be admitted that the immunity evoked by these vaccines is never as solid or as durable as that called out by live virus. Obviously the use of live vaccines has its dangers and limitations. In vaccination against small-pox advantage is taken of the fact that the virus of small-pox, when adapted to the cow, is altered in such a way that when implanted in human skin it gives rise merely to a local lesion, the evolution of which nevertheless confers immunity to small-pox. That this method of vaccination does not represent the ideal is shown only too clearly by the puzzling sequels reported during the last few years. Perhaps a stricter attention to dosage might mitigate or remove this disadvantage, but, be this as it may, the underlying principle involved is an important one, which must be kept in mind. In this respect recent work on the prophylaxis of fowl-pox is of interest. The viruses of fowl-pox and pigeon-pox are immunologically identical, but have so great a species adaptation that the possibility of using live vaccines of the latter virus for immunising fowls against fowl-pox suggested itself. In 1928 Lahaye [4] and Zwick, Seifried, and Schaaf [5] attempted this with some success, and Doyle [6] has now studied the subject afresh. He finds that pigeon-pox virus produces minimal lesions in the hen with no tendency to generalisation and no interference with health; furthermore, the virus does not spread from inoculated to normal birds even under conditions most favourable to contagion. The living vaccine is applied to a small area of skin denuded of feathers, and as a result of the mild infection which ensues the bird becomes immune to fowl-pox. This immunity is fully developed by the end of the second week and, although it does not confer complete protection against artificial infection, the immunity to natural infection is a solid one. Whether this method will prove superior to the use of heat-killed vaccines, which have their advocates, only extensive trial in the field will show, but Doyle reports that during the last six months over 50,000 doses of live vaccine have been supplied for use in infected flocks, and that the results have been very satisfactory.

[3] Published under the direction of Dr. Camille Lian. Paris: René Lépine. 1930. Pp. 570.

[4] Lahaye, J.: Ann. Vét. Méd., 1928, lxxiii., 297.

[5] Zwick, W., Seifried, O., and Schaaf, J.: Zeit. f. Infektionskr., 1928, xxxiv., 300.

[6] Doyle, T. M.: Jour. Compar. Path. and Ther., March, 1930, p. 40.

NEONATAL DEATH.

Yandell Henderson has said that the first quarter of an hour after birth is the most dangerous period of life, and that nothing in medical practice so nearly resembles the methods of the dark ages as those employed in dealing with the new-born baby which does not breathe. Dr. J. N. Cruickshank's study of neonatal mortality (see p. 1032) goes far to confirm this dictum, and shows that the great majority of deaths during the first month actually take place during its first few days. Of 800 infants who failed to live a month he found that no less than 71 per cent. died within a week. The problem of infant mortality—meaning the death of infants who have really established independent existence—is no longer so serious as the problem of stillbirths, for the causes of stillbirth are the causes of very early death. The death-rate in the first week of life is given by the Registrar-General as 23·5 per thousand live births, and in the city of Glasgow the figure is about the same, while for the second week the Glasgow figure is only just over 5 per thousand.

By far the commonest cause of this wastage of infant life is asphyxia and atelectasis, which account for 546 of Dr. Cruickshank's 800 deaths. Theoretical considerations suggest that during its last few weeks in the uterus every fœtus undergoes gradually increasing asphyxia corresponding with the gradual narrowing of the ductus arteriosus. The venosity of the blood reaching the fœtal brain is further increased during labour, when the placental circulation is cut off, and finally the concentration of carbon dioxide becomes so great that the respiratory centre is stimulated to initiate lung breathing. Unfortunately, excess of carbon dioxide paralyses instead of stimulating the respiratory centre, and if the concentration becomes too high the child is born asphyxiated or else the centre fails to establish respiration fully and patches of lung remain unexpanded. At present we have no satisfactory methods of rescuing the respiratory centre from its embarrassment. If one of the contributory causes is hæmorrhage, either from gross injury or from asphyxial ecchymoses, violent attempts at resuscitation may well make matters worse. Dr. Cruickshank suggests the remedy, well known to anæsthetists, of supplying oxygen with 5 per cent. of carbon dioxide, besides ensuring absolute rest, warmth, and quiet, and cleansing the respiratory passages from the amniotic fluid and meconium so often found in them. On the preventive side, improved antenatal supervision is bound to reduce the incidence of asphyxia, prematurity, and birth injuries. Miss Joyce Partridge, as a result of investigations [1] made under her Riddell Research Fellowship at the Royal Free Hospital, concludes that nearly half the infants who are alive at the commencement of labour, and yet are born dead to healthy mothers, die solely because they have sustained intracranial injury at the time of birth. She regards relaxation of the pelvic

[1] Jour. of Obstet. and Gyn. of the Brit. Empire, 1930, xxxvii., 18.

ligaments as a real aid to parturition, which may make all the difference to the clearance between the fœtal skull and pelvic brim. In the pregnant woman an increase in the normal mobility of the joints can be recognised. In a series of 100 cases examined, there were four in whom joint movement was almost absent, and of these two had stillborn infants who suffered from intracranial injuries. In her view treatment based upon the presence or absence of antenatal mobility of the pelvic joints should reduce the numbers of stillbirths.

Another potent cause of early death is infection, either generalised or confined to the lung. It is difficult at present to say how this enters the body, but Dr. Cruickshank suspects the skin and respiratory tract, and finds no evidence for the widespread belief that the umbilicus and gastro-intestinal tract are common portals of entry. This group cannot be sharply distinguished from the first group, since prematurity is a common cause in both, and asphyxia and atelectasis predispose to the development of pneumonia. Dr. Cruickshank's investigations relegate both syphilis and congenital abnormality to a relatively unimportant place in the causation of neonatal death, except that the children of syphilitic mothers are often premature. Many so-called cases of congenital heart are really, he believes, cases of asphyxia livida.

The state of our knowledge hardly permits of very definite recommendations. Meanwhile all concerned with the improvement of maternity and infant life will agree with Dr. Cruickshank when he advocates better antenatal supervision, better education of doctors and midwives, more and better staffed hospital accommodation for lying-in women, and research into the problems of neonatal disease and prematurity. Ignorance of the actual cause of death has, he says, been one of the great obstacles to progress in the past. If a baby which is born blue and dies within a few days of birth is held to be suffering from some congenital cardiac abnormality, there is no stimulus to the obstetrician to worry about it. But neonatal deaths might be considerably reduced if every accoucheur came to feel that asphyxia after birth was as unnecessary and as curable as asphyxia under an anæsthetic.

A NEW CONCEPT OF TUBERCULOSIS.

AT the Royal Society of Medicine (Section of Epidemiology and State Medicine) on April 25th Prof. S. Lyle Cummins discussed some of the clinical and pathological factors underlying mortality-rates in tuberculosis. It must be conceded, he said, that tuberculosis, in spite of the fact that its causative germ is known, and that it has been the subject of endless investigations, is still imperfectly understood. Its manifestations at different age-periods, and under different cultural and social conditions, vary as greatly as if not one but several diseases were concerned. Brownlee's analysis of death-rates in tuberculosis had suggested that behind tuberculosis mortality lay a complex and imperfectly understood disease. The epidemiologist, said Prof. Cummins, should bear constantly in mind: (1) factors concerned with infection, (2) those favouring or retarding the development of infection into disease, and (3) those leading on to or postponing the fatal termination. Each of these three sets of circumstances was, in its turn, dual in nature, depending both upon the infecting germ and upon the infected organism. Epidemiologists, therefore, should not passively receive and analyse the findings and records of clinicians and pathologists, but should actively associate themselves in the attempt to find new methods of approach. A first necessity seemed to him the formulation of some concept which would cover not only the known facts of the disease, but also the equally well recognised facts of infection without perceptible disease. His own observations had led him to such a formula :—

"The first stage of tuberculous infection is one in which the lesions are in a larval state, localised as a rule at or near the portal of entry and in the nearest lymphatic glands, though as yet without any obviously harmful effect on the organism. This larval stage may lead on rapidly to the generalisation of the infection throughout the body, producing the natural tuberculosis characteristic of laboratory animals, infants and the adult members of hitherto uninfected communities after heavy infection; or it may remain latent in the form of larval lesions still capable, under disadvantageous conditions, of activation; or, if held in check, of creating the hypersensitive condition which leads to the inflammatory phenomena associated with reinfection and characteristic of the modified tuberculosis of later life in civilised communities. Alternatively, such larval lesions may serve only as a stimulus to the development of humoral and cellular resistance against the spread of tuberculosis, so that the infective process may end by becoming compensated and ceasing to be any further menace to health."

Such a concept, said Prof. Cummins, seemed to him to cover the known facts, and to afford a starting-point for further inquiries. The "larval" stage of tuberculosis could only be studied at autopsies, where death had occurred from other causes; and the contrast between "natural" and "modified" tuberculosis was also best appreciated in its pathological manifestations. "Modified" tuberculosis, of which the chronic phthisis of middle age was the most typical example, required study on clinical lines, and an examination of the survival periods of classified cases helped to throw light on this phase of the disease. The "compensated" tuberculosis of healthy adults represented a difficult problem which he had attempted to approach by means of tuberculin tests on quantitative lines.

RETIREMENT OF DR. A. B. RITCHIE.

ON April 23rd Dr. A. B. Ritchie retired after nearly twenty-seven years of service as medical officer to the Manchester Education Committee. The regular school medical service did not receive Parliamentary sanction until 1907, but Manchester was among the more progressive authorities which appointed its own officer before that time arrived. For six years Dr. Ritchie worked with one assistant, and in 1909 four medical officers and five nurses were appointed to assist him in carrying out the national scheme. His staff continually grew until at the present time it includes 19 full-time assistant medical officers, 4 specialists, 8 full-time dentists, 62 nurses, and 4 masseuses, while there are 9 school clinics covering the whole field of minor ailments and dealing with defective vision, the X ray treatment of ringworm and other skin affections, the ionisation of ears and the ultra-violet radiation of a variety of conditions. Dr. Ritchie also had medical charge of an epileptic school which accepts cases from all parts of the country and is the only one of its kind managed by an education authority. An orthopædic clinic is also now in operation, with two specialist surgeons; part of this scheme was the school for crippled children at Swinton, of which Dr. Ritchie had medical charge, and there is also a day cripple school, further developments being in contemplation. The ascertainment of mental deficiency has been under his control and the allocation of cases to the special schools. Of all this work Dr. Ritchie laid the foundations and built up a large part of the superstructure. On his retirement the medical and administrative officers both made him a presentation, and he received a token of appreciation from the teachers of the special schools for physically and mentally defective children. The gifts were tangible evidence of the real affection which Dr. Ritchie has inspired among his staff who although officially under his control were made to feel like professional colleagues; his reports always gave full credit for any special work done by his assistants. Dr. Ritchie's position of direct responsibility to the education committee is now unusual; the arrangement still exists at Birmingham, Leeds, Newcastle-on-Tyne, Stoke-on-Trent, and a few other places. The question of the relation of the public health department to the school medical

service will naturally arise on Dr. Ritchie's retirement, but it is evident that in an area of the size of Manchester the hands of the medical officer of health are already full with the work of the public health and poor-law services so that his control of school medical work can be little more than nominal.

ACADEMIC MEDICAL WORK.

THOUGH the origin of many of the British medical schools is independent of the universities, they have now all become attached to academic institutions while retaining a considerable measure of autonomy. They stand only on the fringe of academic life, however, for they are bound to regard with respect the prejudices of the voluntary hospitals which supply their clinical material, and to adjust the demands made by charitable institutions and by university conditions on the men who are chosen by a joint committee to serve both. The overwhelming amount of administrative work which falls to university professors, especially those attached also to hospitals, was the subject of comment in the last annual report of the Medical Research Council, and is emphasised by the report for the year 1928–29 of the University Grants Committee.[1] This committee notes that the embarrassment of excessive administrative work is not a new one; it was deplored over 40 years ago by the late Prof. Henry Sidgwick, of Cambridge, who made the following despairing entry in his journal: "Alas! with boards general and special, committees of boards, syndicates and sub-syndicates, there is a luxuriant fungoid growth of administrative work feeding on the best juices of academic life. One longs for a benevolent despot, 'one still strong man,' in a blatant University." The head of a big scientific department at a modern university, asked to estimate the proportion of his time spent on routine and administrative work, on teaching and on research, complains that research has usually to fight a losing battle against matters of urgency. He adds that men invited to join the department have given as a reason for their refusal the fear that administrative duties would prohibit their getting on with their own work, and that they are right.

The heads of departments, who are largely chosen in the first place for their original work, should assuredly be free to carry it out. The problem is partly, but not entirely, an economic one. The provision of secretarial assistance for heads of big departments would undoubtedly save a good deal of time, but even more, it seems, would be saved by such a simplification or rearrangement of a university's—and a hospital's—business as would lighten the labour of attendance at conferences and committees.

Other questions discussed in the University Grants Committee report deal with salaries, superannuation, tenure of office and status, the social life and employment of students, and the promotion of post-graduate scholarships. The report is partly statistical. It gives the detailed income and expenditure of some 50 universities or colleges subsidised by the Treasury through this committee, whose annual budget of £1,550,000 is to be raised next year to £1,800,000. Other tables show the number, age, and sex of the students, the faculties in which they are distributed, and whether the object of their study is to obtain a diploma, a degree, or a higher qualification. The overlapping of certain figures and the omission of all information about Guy's Hospital Medical School, which does not accept official help, necessitates scrupulous care before general conclusions are drawn from the tables lest inferences should not be justified. For example, in certain of the London medical schools the proportion of students who have acquired a diploma rather than a degree is apparently as high as 12 to 1, and in one of the schools 22 diplomas but no degrees were obtained in the year under review; but since the degrees in medicine and surgery granted by the universities of Oxford and Cambridge are included only in the figures of these universities, this proportion of students in each school reading for the diploma of the conjoint or any other board, and not for a university degree, cannot be ascertained. The omission of Guy's indeed diminishes the value of all the comparative information provided about the London schools, but a good deal may be inferred from the figures given. The examination of the tables included in succeeding annual reports of the University Grants Committee gives a fair moving picture of the waves of popularity of the institutions composing the universities of the United Kingdom.

[1] H.M. Stationery Office. 1930. 3*s*. 6*d*.

INJECTION TREATMENT OF PILES.

SLOUGHING occasionally occurs after injection of hæmorrhoids with 5 per cent. quinine-urea, and Dr. B. Saad, of Beirut, reports an incidence of ten such cases among 600 injections. The usual symptoms, he says, are immediate pain of variable extent, a feeling of weight in the rectum, dysuria, and a constant desire to defæcate. A swelling can be palpated with the finger, and proctoscopy shows a sloughing pile. The slough takes 10 to 15 days to separate, and always heals. There are several causes of this complication, the commonest being reinjection of a pile already sclerosed by a previous injection, or too superficial injection. Saad repeats Bensaude's advice—never to inject an external pile or a prolapsed internal pile without first reducing it, and never to inject a pile that is already sclerosed. Furthermore, the injection should always be made deep into the submucous layer. For treatment of a slough, hot baths and local application of Ziehl's solution are recommended.

ETHYLENE ANÆSTHESIA.

THE acceptance of ethylene as an anæsthetic has been far wider in the United States and in Canada than in Great Britain. A questionaire recently circulated to hospitals in America elicited replies relating to 332,721 administrations of the gas. This popularity may perhaps follow naturally the fact that the modern use of ethylene was initiated in Chicago. The gas had been tried as long ago as the middle of last century by Dr. Thomas Nunnely, of Leeds, but it had never come into general use at all, partly, no doubt, through chemical difficulties in preparation. The reason why it is not very frequently used in England appears to be mainly that its advantages over nitrous oxide are so slight when the latter is given in the manner now made possible by the evolution of efficient and easily controlled machines. Ethylene is a little the more potent of the two gases, and has superior relaxing powers. This slight advantage, however, hardly seems to weigh against nitrous oxide used with judicious addition of small amounts of ether. That, at any rate, was the conclusion we arrived at after listening to the discussion which followed Mr. R. J. Clausen's paper at the Royal Society of Medicine and to that excellent paper itself. Mr. Clausen was an enthusiastic but judicious advocate of ethylene after the experience of 371 cases. He had administered the gas for as long as 2 hours and 25 minutes in one case. The main objection to ethylene in the minds of many is its highly offensive smell. Mr. Clausen meets this by conducting away the patients' expirations through a length of rubber tubing which terminates either at the edge of the theatre or actually outside it. Apparently about 50 gallons of the gas are needed per hour, and in abdominal cases it is almost always necessary to use some ether to obtain due relaxation. The risk of explosion does not appear to be so formidable a bogy here as in America. The questionaire referred to above revealed ten instances of explosion, involving three minor injuries, four destructions of equipment, and one death.

CONTINUOUS BATH TREATMENT OF HEBRA.

TREATMENT by continuous immersion is associated with the name of Ferdinand Hebra, who employed it for various kinds of cutaneous diseases half a century ago at the Allgemeines Krankenhaus in Vienna. In the *Journal* of the American Medical Association for April 5th Dr. Gustav Riehl describes the present day applications of Hebra's method. The construction of the bath is designed to permit of the immersion of patients for periods of days, weeks, or even months continuously in plain water, medicated if necessary, at a temperature ranging from 85° F. upwards according to the requirements of the individual case. Mechanical arrangements ensure the easy transference of the patient into and out of the bath, the maintenance of a uniform temperature, and the rapid cleansing of the bath. At the hospital there are 22 of these baths in operation. Good results are claimed in the treatment of extensive burns, psoriasis, acute generalised dermatitis, weeping eczema, pemphigus, erysipelas, and other affections of the skin; of surgical cases, including septic wounds, discharging sinuses, fistulæ, bed-sores, and frostbite; of medical cases such as painful polyarthritis; and among neurological cases of myelitis, multiple sclerosis, tabes, tetanus, and certain psychical disorders accompanied by agitation or delirium. In this country such treatment has never been extensively employed. Years ago it was advocated by Sir James Barr in the treatment of typhoid fever, but the method never came into general use. Prolonged immersion, of some hours' duration, is employed on occasion in the treatment of skin affections and, for its sedative effect, in psychological disturbances; but there is no installation comparable to that described by Dr. Riehl, treatment when given being in some simple adaptation of the ordinary bath at home or in hospital. The continuous bath involves the use of expensive apparatus, special nursing and attendance, and is only practicable in an institution. In view of the wide range of cases for which benefit is claimed, such an installation should be attached to a general hospital, but the expense of installing, maintaining, and operating a suite of such baths would hardly be undertaken by the management of any hospital unless convincing evidence is brought forward that continuous immersion offers advantages in a wide range of maladies, unattainable by simpler methods. In the case of extensive bed-sores, burns, and septic wounds, the Viennese experience is certainly such as to render the method worthy of imitation in this country; a beginning might be made with a few experimental baths, to be extended if found to justify their existence. Possibly one or other of the new clinics for the treatment of rheumatic disorders might offer facilities for a trial.

VETERINARY RESEARCH IN SOUTH AFRICA.

THE first report[1] from the Onderstepoort Laboratories under the new director, Dr. P. J. du Toit, successor to Sir Arnold Theiler, lacks none of the excellence of previous reports, and there is substantial gain from the grouping of the articles into nine sections: protozoal diseases, virus diseases, bacterial diseases, parasitology, pathology, diseases due to poisonous plants, sterility, mineral deficiency, and miscellaneous. No one can study it without being impressed with the value, not only to the agricultural community but to the country generally, of State-aided research in veterinary science. The money expended by the Union of South Africa upon the development of the splendid organisation at Pretoria and upon its maintenance must have been repaid many times over by the results achieved in the prevention of animal diseases. Practical recognition of the value of the work to the Empire has now been given by the award of a capital grant of £10,000 and an annual grant of £11,000 for five years from Empire Marketing Board funds. A series of excellent photographs in the report shows the laboratory buildings and the animal accommodation. The laboratories have an extensive staff, the professional members of which alone number nearly 30.

One or two points of special interest may be selected for mention. The South African workers had until recently held the view that east-coast fever (*Theileria parva*) could not be transmitted with the blood of infected cattle, but the work of Sergent and others in North Africa in 1927 led them to carry out further observations upon this point, with the result that in 24 per cent. of cases it was found that infection resulted from blood inoculation by the subcutaneous and other routes, and that nearly 50 per cent. of these infections ended fatally. Quantities of blood such as 5 c.cm. intradermally, 100 c.cm. intraperitoneally, and 250 c.cm. subcutaneously resulted in infection. From this it would appear that Koch's bodies are by no means rarely present in the general circulation. Further studies have been carried out on the virus of bluetongue, a disease of sheep in certain parts of South Africa. Theiler, in 1905, showed this condition to be due to a filtrable virus in the blood, and found that by passage of the virus artificially through sheep it became so attenuated after the eleventh generation that it could be used with safety as a vaccine. Deaths were reduced from 11 per cent. to less than 1 per cent. For over 20 years Theiler's originally attenuated strain of virus has been used and has reached the fifty-fourth generation. No less than 25,000,000 doses of vaccine (blood) have been issued with eminently satisfactory results. The attenuated vaccine is preserved in a mixture of glycerin, potassium oxalate, and carbolic acid, in which it has shown remarkable longevity. In the present report it is pointed out that Theiler's work has been fully confirmed and a new strain of the virus has been attenuated for field use. Vaccine preserved as described has been found alive after 18½ years at room temperature, though its antigenic properties were somewhat weakened. This illustrates the remarkable resistance of this virus, a feature also of the virus of South African horse sickness.

The articles upon botulism in animals and birds in South Africa are of interest alike to the medical and veterinary research worker. Botulinus type organisms have been shown to be widely distributed in the soil in South Africa, and the types found by Robinson are considered by him to be the types D and E (Weinberg), though, as he remarks, it seems inconceivable that types A and B can be absent from South Africa when they are known to have such a ubiquitous distribution in other countries. Cases of human botulism have not so far been recorded in the country; botulism has, however, been found in cattle, horses, and birds in South Africa. In cattle the source of the toxin is the bones of carcasses which cattle are induced to eat on account of a phosphorus deficiency in the soil, in horses the source is the carcasses of rats in the fodder, and in ducks the source was not determined. The South African workers have been unable to show that toxin-free bacteria of botulinus type can produce toxin in the alimentary canal of the living animal. Investigations into the life-history of the tapeworm (*Moniezia expansa*) leave the problem still unsolved. There is an interesting account of the pathological lesions attributed to schistosomes in sheep. The article on skin cancer of the Angora goat is a useful addition to the growing literature upon cancer in the domesticated animals. The section of the report devoted to sterility in cows by Prof. Quinlan occupies no less than 222 pages containing 88 illustrations, and that dealing with the breeding of cattle upon phosphorus-deficient veld occupies 107 pages, including 71 illustrations. Three of the longest articles are theses which have been accepted for the degree of D.V.Sc., one of Toronto and two of the South African University.

[1] Fifteenth Annual Report of the Director of Veterinary Services, Department of Agriculture, Union of South Africa, 1929. Two vols. Pretoria: Government Printer. Pp. 1209. 10*s*. per vol.

CONGRESS FOR SEX RESEARCH.

THE second International Congress for Sex Research will be held in London in the House of the British Medical Association, Tavistock-square, W.C., from August 3rd–9th. The preliminary programme provides for general meetings, to be held in the morning, at which problems of present interest will be reviewed by prominent workers. The afternoons will be devoted to discussions on the general papers and sectional meetings. Among the subjects to be discussed at the general meetings are puberty and maturity, problems of the physiology of the sexual glands, and hormone therapy. Membership of the congress is restricted to persons engaged in teaching or research in biology, psychology, and allied sciences and to members of the medical profession. Those who wish to take part are invited to apply to the Congress Secretary, Department of Animal Genetics, King's-buildings, The University, Edinburgh.

THE next session of the General Medical Council will commence at 2 P.M. on Tuesday, May 27th, when the President, Sir Donald MacAlister, will take the chair and give an address.

Dr. Julia Marcella Browne has been appointed medical officer of health for the Metropolitan Borough of Stepney in succession to Dr. Daniel Thomas who died in December last. This is the first time a woman has secured a whole-time post as chief M.O.H., although others have held acting rank in St. Pancras for considerable periods. Dr. Browne graduated in medicine from University College, Cork, in 1917, taking the diploma in public health of the R.C.S.I. in 1920.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LXXI.

THE SIGNIFICANCE OF BLOOD GROUPS.

PART II.*

Testing for Compatibility.

PRACTITIONERS faced with the possibility of being called upon to perform an emergency transfusion are prone to seek some sign of compatibility, but none can be given them. The mixture of drops of the blood of proposed donor and recipient on a slide may produce some doubtful agglutination, more frequently it will merely produce a mess. There is no short cut to the certain determination of compatibility. For a grouping test known sera of Groups A and B and an emulsion in normal saline of the red cells of the proposed donors are required. Whole blood will give rise to trouble from various causes, the principal of which is rouleau formation. The sera may be bought from various commercial houses but as noted last week its titre is always rather uncertain. Sufficient blood for the testing of the donor can be obtained by simple finger prick. The strength of the emulsion does not matter within wide limits; it is my custom to use the red cell pipette of the Thoma-Zeiss hæmacytometer and to make approximately a 1 in 100 dilution of the blood in normal saline. In the absence of a pipette a couple of drops in two or three c.cm. of normal saline in a test-tube will serve.

For the actual grouping two plane slides are required; these are marked A and B respectively; one drop of the red cell emulsion is placed on the centre of each of these slides; to the drop on the slide marked A a drop of the A serum is added and to that on the B slide a drop of the B serum; red cells and serum are then thoroughly mixed. In some case agglutination will appear at once with the appropriate serum; the rapidity of its appearance depends upon the titre of the agglutinins in the serum and of the agglutinogens in the red cells. In no case is it safe to make a final determination until the preparations have stood for at least ten minutes and it is my custom to allow half an hour. The drops of mixed red cells and serum should be gently agitated before they are examined. It is preferable to examine them with the low power of the microscope but failing this a hand lens will serve; naked eye observation may fail to identify lesser degrees of agglutination.

In matching two bloods the procedure is exactly the same as for grouping, the only difference being that in matching the red cells of the proposed donor are mixed only with the serum of the proposed recipient. Since matching does not demand the use of sera of known groups, it is in some ways simpler than grouping, and as pointed out above is infinitely preferable on considerations of safety. The difficulty in matching is that it demands the serum of the proposed recipient. For this purpose two or three c.cm. of blood are required; this quantity can be obtained readily enough, but the difficulty arises in the speedy separation of the serum. With a centrifuge the serum can be separated out in a few minutes and where this apparatus is available the whole procedure of matching can be carried out in half an hour. Where no centrifuge is available, there is nothing for it but to withdraw the blood of the proposed recipient as soon as it becomes evident that a transfusion may be necessary, and to allow the serum to separate out while the donors are being collected. This usually takes an hour or so and by the time that the donors are ready enough serum may be available for the test. Whenever possible, however, the proposed donors should be sent, with a specimen of the serum of the patient, to a properly equipped laboratory and the test should be performed by a person with ample experience of the technique.

Matching is only necessary when the blood is to be introduced actually into the circulation of the recipient. Where blood is to be introduced hypodermically or intramuscularly, as is often necessary in hæmophilia, purpura, melæna neonatorum or other hæmorrhagic conditions, the group of the blood introduced is of no importance. Since it is known that the agglutinins do not develop until some months after birth it is also probable that no harm would be done by the introduction of blood without grouping or matching into the circulation of a new-born child, but if possible it is the best plan in all cases where blood is introduced into the circulation to make sure of compatibility.

Medico-legal Applications.

The blood groups have certain important medico-legal bearings. Since the agglutinogens A and B behave as Mendelian dominants, they cannot appear in the blood of the offspring without having been present in the parental blood. From this it follows that their appearance in the blood of a child when they are absent from that of the putative parents, is in itself proof that the relation is not that supposed. This fact has obvious importance in cases of disputed paternity. The field of possibilities under this head has within the last few years been considerably narrowed as a result of the work of F. Bernstein who from mathematical considerations has provided strong evidence for the belief that the whole inheritance of the groups is governed by the existence of the dominant factors A and B, represented by the agglutinogens, and of a recessive represented by the absence of both of them; this rece sive, in conformity with the nomenclature used above, may be described as O; according to Bernstein's hypothesis it is allelomorphic to A and B.[1] For practical purposes the position under Bernstein's hypothesis may be summarised as shown in Tables II. to IV.

All the available evidence goes to bear out the correctness of Bernstein's hypothesis, and there can be little doubt that apparent exceptions are due to errors of observation. No case of disputed paternity has yet been decided in the British courts upon the evidence afforded by the blood groups, but such

* Part I. appeared last week.

[1] See THE LANCET, 1928, i., 1182.

evidence has been freely admitted before the German courts and in a number of cases has been decisive. The writer has twice been asked for opinion in cases of disputed paternity; in both cases the evidence afforded by the blood groups was equivocal and was not placed before the court. In placing evidence as to blood group before a court in a case of disputed paternity it is not sufficient to rely only upon tests of the red cells; the serum also must be tested with red cells of known agglutinogen content, and in view of the differences of titre

TABLE II.

Parents.	Offspring.	
	May be.	Cannot be.
AB + AB.	AB, A or B.	O.
AB + A.	,,	,,
AB + B.	,,	,,
AB + O.	A or B.	AB or O.
A + A.	A or O.	AB or B.
A + B.	AB, A, B or O.	No group impossible.
A + O.	A or O.	AB or B.
B + B.	B or O.	A or AB.
B + O.	,,	,,
O + O.	Must be O.	AB, A or B.

TABLE III.

Group of child.	Group of mother.			
	AB.	A.	B.	O.
	Paternal group must be—			
AB.	A, B, or AB.	B or AB.	A or AB.	Impossible.
A.	Any group.	Any group.	,,	A or AB.
B.	,,	B or AB.	Any group.	B or AB.
O.	Impossible.	O, A or B.	O, A or B.	O, A or B.

TABLE IV.

Group of child.	Group of mother.			
	AB.	A.	B.	O.
	Paternal group cannot be—			
AB.	O.	O or A.	O or B.	Impossible.
A.	All possible.	All possible.	,,	O or B.
B.	,,	O or A.	(All possible.)	O or A.
O.	Impossible.	AB.	AB.	AB.

in both agglutinogen and agglutinin it is desirable to confirm all results by absorption of a known potent serum of Group IV. with the red cells of the subject. Mere testing of the red cells against known sera of Groups A and B is by no means a satisfactory way of establishing the blood group for medico-legal purposes.

Blood Groups in Criminal Cases.

The determination of the blood groups has certain other medico-legal applications mainly in connexion with criminal practice; thus it may be of importance to determine the group of the blood staining clothing or weapons in cases of murder and wounding. The establishment of the fact that blood stains on the clothing of the accused are of the same group as that of the victim, and different from his own, would be a very strong point for the prosecution; so thoroughly has this been realised on the continent that in certain European countries, of which Russia is one, it is customary to determine the blood groups of all persons concerned with crimes involving wounding. When it is desired to ascertain the group of blood staining clothing or instruments no attempt should be made to remove the blood, but the stained articles should be despatched with speed and with as little disturbance as possible to the laboratory at which they are to be examined.

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Special Articles.

THE TOXÆMIAS OF PREGNANCY.

EXPERIENCE IN SIAM AND IMPRESSIONS WHILE TRAVELLING.

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I THINK it is impossible to exaggerate the importance of the contention that any explanation offered for a disease should have a universal application. It has been my privilege this year to travel from Japan through French Indo-China, Malaya, India, Iraq, Syria, and Palestine to Cairo. I visited hospitals in all these countries and in the ports of China, and met and conversed with a considerable number of doctors. There is not the slightest shadow of doubt that the toxæmias of pregnancy are very much less common throughout the East, if Japan be excepted, than they are in the West. Hyperemesis gravidarum is practically unknown in these countries. Accidental hæmorrhage of the toxæmic variety is an exceedingly rare obstetric complication, while eclampsia is much less common than in the West, and usually of a milder type. It is obvious that in such countries accurate statistics are not available, and opinions must be formed from the figures of isolated hospitals and from the experience of practitioners with whom one comes into contact. A letter received from Colonel Graham, I.M.S., Public Health Commissioner with the Government of India, states that the statistics I requested, showing the incidence and distribution of the toxæmias of pregnancy in India, are not available. It would be of great value if some responsible person could spend the time travelling and collecting such statistics as are obtainable in these countries.

Three Years in Bangkok.

I can speak with more authority on the incidence of these diseases in Siam. I have met nearly all the missionary doctors in the country, and they are emphatic that all the toxæmias of pregnancy are very rare. Not one doctor had ever seen a case of toxæmic accidental hæmorrhage, and I could only hear of six cases of eclampsia in their united experience, most of the doctors never having seen even one case. No system of purdah obtains, and if these diseases existed the doctors would most assuredly be cognisant of them. Bangkok is a city of some 700,000 inhabitants. I was for nearly three years in charge of the largest obstetric service in the city, larger than all the other obstetric services in the country put together. I did not see a single case of toxæmic accidental hæmorrhage.

The following list comprises all the toxæmic cases that I saw.

1. There were seven, possibly eight, cases of eclampsia, but only four had fits in the hospital.

2. Seven patients suffered from a severe grade of anæmia, presumably aggravated by the pregnancy, but only one from the pernicious type.

3. Two fatal cases of toxæmia were associated with hydatidiform moles. One of these patients suffered from hyperemesis gravidarum, and the other had anuria.

4. Two fatal cases of toxæmia were associated with mania early in the pregnancy; neither of them came to autopsy. It is just possible that these patients suffered from malignant malaria.

5. I saw, in consultation, one case of hyperemesis gravidarum in a wealthy neurotic Siamese woman. The vomiting was completely checked, but the patient nevertheless died a day or two later. No post-mortem examination was permitted. This was the only case of hyperemesis gravidarum associated with a normal pregnancy that I saw in a Siamese woman, although in the same period I was called to see three European women who suffered from

this complaint, although the European population of Siam is so small. No Chinese woman suffering from this complication was admitted to the hospital.

Bathing in Public.

This almost complete absence of the toxæmias of pregnancy was very surprising and extremely suggestive. Pyorrhœa alveolaris is the rule rather than the exception in Siam. Practically every patient is infected with one or more varieties of intestinal parasites. Cystitis and nephritis are common. So common is a mild chronic nephritis among the women that I believe it to be an ascending infection from the bladder. They all bathe twice or more often in the day in the klongs or canals into which they urinate and defæcate; the water must be a fine emulsion of bacteria. They bathe in a sarong or panung, which is similar to a wide skirt, which reaches from their axillæ to well below their knees. When a woman wearing such a garment sits down rapidly in the canal there is a very definite pressure of water forced between her legs, and I believe well into her vagina and urethra. I caused a woman, an hour after she had drunk plenty of water, to bathe in a bath in which was a strong solution of methylene-blue. The dye did not stain the thighs or the mucous membrane of the vulva. On urethroscopic examination, however, a distinct jet of methylene-blue was seen to escape from a crypt on the left side of the urethra about ¾ inch from the external meatus. It is interesting to notice that Mohammedan women are not allowed to bathe between the hours of sunrise and sunset during the fast of Ramadan, although no such restrictions are placed on men.

Although chronic nephritis is exceedingly common, marked albuminuria during pregnancy is rare. Lactosuria is excessively rare, and was only noted in one out of about a thousand patients whose urine was examined for sugar. In this case the urine only reduced Fehling's solution for two days. Appendicitis is certainly relatively very uncommon, while disease of the gall-bladder of any kind whatsoever apparently does not exist among the Siamese. The Siamese eat three meals in the day. Their diet consists of rice, cooked vegetables, a little fish, usually salted, and a little pork perhaps once a week. The wealthier classes in the cities are tending to eat more meat. As a race they do not suffer from constipation but rather from diarrhœa caused by the intestinal parasites. Contrary to the statements made by theoretical enthusiasts, the people living in the most primitive parts of Siam have their bowels opened only once in the day, and usually in the morning. The climate is always fairly warm and the clothes are so convenient that a woman can defæcate at any place at any time of the day. The world is her privy and her panung is her closet.

Simple Life.

Their clothes are light, frequently changed and washed, and allow a generous portion of the body to be exposed to the beneficent rays of the sun. They almost live in the open air. The children run about naked until they are 4 or 5 years of age, the little girls merely wearing a silver or gold sporran. There is a complete absence of worry and haste, partly accounted for by the Buddhist doctrine and partly by the ease of living in a generous country in the tropics. A little rice, a few vegetables, a little tobacco, a home-spun cloth, a house that can be built in a few days—these are all the wants of the peasants who live to-day in the same way as their forefathers did a hundred years ago. Their diet is obviously deficient in vitamins A and B, as vesical calculi and beri-beri are very frequently encountered. The good effect of sunlight can be gauged by the fact that rickets is practically unknown, and I have not seen one flat pelvis in a Siamese woman. There is one other article of diet that must be mentioned. The Siamese constantly eat lime with their betel- or areca-nut. This may provide the women with the necessary calcium, for they never drink milk and there is certainly not much calcium in their food.

The Ports of China.

In China I visited Shanghai, Hong-Kong, and Swatow. Gall-bladder disease, appendicitis, cancer of the intestines, and the toxæmias of pregnancy appear to be very uncommon in Southern China. A doctor who had been for 20 years in charge of a hospital near Amoy, in which 20,000 patients were treated annually, told me that during the whole of that time there had only been one case of appendicitis in a Chinese patient living on a Chinese diet. The figures of the Margaret Williamson Hospital, Shanghai, the largest hospital for women in China, suggest a higher incidence of these conditions in Shanghai than in Siam or Southern China. The women there, however, do not live in the same simple manner as in the country. They buy sweetstuffs and cooked foods from the itinerant hawkers who parade the streets all day and well into the night, and are very constipated. The climate is very cold during the winter months and the women wear thick clothes, which are not frequently washed or changed. Moreover, it must be remembered that human urine and fæces have a distinct commercial value in China, and a Chinese woman will resist the temptation to pass fæces until she can deposit it in her family store, when her nitrogen can either be sold or used for the household gardens. This reticence in a large city tends to favour constipation. Then, too, the Chinese trousers are not so convenient as the Siamese panung.

India and the Nearer East.

In India the toxæmias of pregnancy are not common, but their distribution is interesting. The large cities appear to provide a higher percentage of cases than the country areas in which the vast majority of Indians live. This increased incidence in the cities is probably universally true. Eclampsia is fairly common in Southern India—i.e., Madras and Bangalore. There were only ten cases of accidental hæmorrhage recorded in the three annual reports that I have of the Madras Government Maternity Hospital, although there were in that time over 8000 deliveries. Moreover, 10 per cent. of the patients treated were Europeans and Anglo-Indians. I visited the large Lady Hardinge Hospital for Women in Delhi, and they had not had a case of eclampsia or accidental hæmorrhage for over 12 months. Osteomalacia, however, is very common there and in the north-west of India; it only affects those women who live a very secluded purdah life. Anæmia is very common throughout the East and is largely due to intestinal parasites, especially the hookworm, which infest so large a proportion of the people. The anæmia is aggravated by pregnancy and is usually of the secondary type. In Bombay, however, anæmia of the pernicious type is frequently associated with pregnancy. This anæmia only occurs during the hot season and is remarkably amenable to treatment by liver extract, whereas the ordinary secondary anæmia is not influenced by this preparation. The diet, climate, habits, clothes, and customs vary enormously in that vast continent. For instance, rice is the staple diet in Southern India, whereas wheat is eaten in the North. No Indian, however, eats much meat. Life there, outside of the cities, is tranquil and the sun shines every day, except in the houses of those unfortunate women doomed to a strict purdah existence.

I visited practically every mission hospital in the Persian Gulf. Not one of the doctors had seen a case of accidental hæmorrhage or hyperemesis gravidarum. Their impression was that eclampsia was distinctly less common there than in America. I visited the excellent new hospital and medical school at Bagdad. They had not had a case of hyperemesis gravidarum or accidental hæmorrhage, and had not lost a case of eclampsia. Dr. Dorman, for many years professor of obstetrics and gynæcology in the American University at Beirut, had never seen a case of accidental hæmorrhage, and was of the opinion that it was a text-book disease to be put in the same

category as locked twins. Eclampsia, in his experience, was uncommon and was certainly less frequent during the war when meat was scarce and the diet restricted.

In Jerusalem and Cairo the same emphatic assertions were made about the relative rarity of the pregnancy toxæmias. On the other hand, the surgeons in Jerusalem and Cairo were convinced that appendicitis was on the increase in those cities, and that the increase of cases synchronised with a greater consumption of meat, both fresh and tinned.

Appendicitis in Japan.

In concluding this rapid survey I must refer to the astounding difference in the incidence of diseases between Japan and the rest of the Orient. At one surgical clinic in the Imperial University of Tokyo there were between 80 and 100 operations for carcinoma of the stomach, and between 200 and 300 appendicectomies in the year, out of a total operating list of about a thousand cases. I gathered, from what was told me in Tokyo and Kyoto, that diseases of the gall-bladder, cancer of the intestines, appendicitis, and the toxæmias of pregnancy were as common in Japan as they are in Europe. The large cities of Japan are very similar to those of Europe, although the sanitary arrangements are bad, while the climate is very little better than that of England. The houses are small, badly ventilated, and badly warmed, usually by charcoal stoves. The Japanese lavatories are certainly anything but attractive, and the women are said to be very constipated. The exquisite kimono, while being a thing of entrancing beauty, is certainly not hygienic and denies access to the body to even the most inquisitive rays of the sun. The diet would appear not to be very dissimilar from that of the Chinese and Siamese. It seems to be deficient in calcium, for the Japanese do not drink milk, neither do they chew the betel-nut with lime. They also probably eat more than do the Chinese and Siamese, while the more educated Japanese are tending more and more towards European habits, customs, and diet. Moreover, the Japanese, from whatever angle they are judged, can hardly be said to be oriental in the same sense as the Southern Chinese and Indians.

THE CAUSES OF NEONATAL DEATH.

A STUDY of 800 cases of death within the first 28 days after birth has been made in Glasgow by Dr. J. N. Cruickshank, and his results are published by the Medical Research Council.[1] It has previously been shown that the first week of life is the most dangerous, and in this series 71 per cent. of the infants died within seven days. Of the remainder, 18 per cent. died during the second week, 8 per cent. during the third week, and 3 per cent. during the fourth week. The fact that the maternal death-rate and the first-week infantile death-rate have remained stationary, despite the striking reduction in the later infantile death-rate, suggests the possibility of some connexion between the two. The two main groups of causes of death among new-born infants are injuries or disturbances due to delivery, and illness or infection. A third small group is represented by developmental abnormalities, and a fourth by thrombosis or hæmorrhage associated with maternal toxæmia. Recent work, it is stated, has tended to minimise the significance of environmental influences and malnutrition before birth.

Asphyxia Neonatorum, Birth Injuries, and Allied Conditions.

Group 1.—There were 540 cases in this group, 140 mature and 400 premature. In 51 of them some pneumonic consolidation was found, either by the naked eye or microscopically; only three of these were mature infants. Many of the children showed birth injuries; 146 had gross intracranial hæmorrhage, and 121 had tears in the dura. The effects of the injury and, to a certain extent, the liability to the injury are increased by the asphyxial congestion present in the new born child. Sixteen in this group showed develop mental anomalies and 15 of them had syphilitic mothers.

Dr. Cruickshank describes these cases as "delayed stillbirths." For some reason or other these children had not succumbed during birth, but had survived in a more or less precarious state for periods varying from a few hours up to three weeks. Fifty-one of them lived on into the second week, but the two which survived this period were exceptional. A certain degree of asphyxia is a physiological accompaniment of the transition from intra-uterine to extra-uterine life and the consequent readjustment of the circulation. Failure to establish full respiration causes atelectasis, a very common accompaniment of asphyxia in neonatal deaths. This is associated with engorgement of the viscera and hæmorrhages. An unexpanded lung with widespread hæmorrhagic œdema is common in premature infants who live for a few days, and affords ideal conditions for the growth of organisms; hence broncho-pneumonia is often superadded. The two main factors which seem to be important in the production of asphyxia are the fact that an excess of carbon dioxide will paralyse the respiratory centre and that the centre may have its vitality diminished by interference with its blood-supply. The theoretical explanation for the establishment of respiration during parturition is that the carbon dioxide tension in the fœtal blood is steadily increased during the later weeks of pregnancy, owing to the narrowing of the ductus arteriosus, and finally to the interruption of the placental circulation. The child is thus in a state of partial asphyxia until the respiratory centre is sufficiently stimulated by the carbon dioxide to establish respiration. If, however, the concentration of carbon dioxide is too great, the centre will fail in this task. In other cases the centre may fail as a result of pressure on the cerebral circulation during birth.

Asphyxia produces engorgement of the veins throughout the body, embarrasses the heart, and ruptures small capillaries, causing hæmorrhages of greater or lesser extent. Dr. Cruickshank believes that the underlying asphyxial element is important—even where there are gross injuries—in determining the extent of bleeding. That heart failure plays a significant part in some of these deaths is shown by the fact that withdrawal of blood from the umbilical stump will sometimes revive a moribund infant. Œdema of the brain and meninges is practically always found in asphyxial cases and may be the cause of death.

Neonatal Infections.

Group 2.—Generalised septicæmia—i.e., multiple foci indicating a spread of infection by the blood stream—was found in 120 infants, often in association with pneumonia. Infection before labour must be very rare, but intra-partum infection is probably more important than was once realised. Even in cases of septicæmia it is rare to find inflammatory changes in the stump of the cord, and the portal of entry of the infection is still a matter of conjecture. The infant's skin is very vulnerable, and many cases of sepsis are started by surface lesions, such as pemphigus, eczema, furunculosis, intertrigo, and napkin rashes. Owing to the difficulty of deciding whether a pneumonia is primary or secondary, it is hard to estimate the relative importance of the respiratory tract. Inhaled infection undoubtedly causes many cases of pneumonia in babies, and many of these children die with generalised septicæmia. Infection by swallowing is probably much less common.

[1] Special Report Series, No. 145. London: H.M. Stationery Office. 1930. Pp. 87. 1*s.* 6*d.*

The Lesions found Post Mortem.

In asphyxia livida the most striking feature is the venous engorgement with petechiæ and extravasations. In asphyxia pallida there may be no congestion, but the distribution of blood does not follow the same laws as in adult shock. Developmental abnormalities were rare and most of the cases of supposed congenital heart disease are probably cases of asphyxia livida. There was never any myocarditis or endocarditis, even in septicæmic cases; small hæmatomata may simulate vegetations if the valves are not examined histologically. Pericarditis was found in six mature and seven immature infants. Pneumonia was the commonest lesion appearing in 197 cases, and in practically two-thirds of all non-asphyxial or atelectatic cases. The distribution and spread of the lesions is bronchial but the patches often resemble those of adult lobar pneumonia; the infection more often occurs in incompletely expanded lung, especially in weakly premature children. The respiratory tract often contains liquor amnii and meconium, and this factor undoubtedly predisposes to pneumonia. Two groups of pneumonia are to be distinguished. The histological features of the atelectatic type are: (1) great congestion; (2) irregular expansion; (3) patchy distribution of consolidation and catarrh; (4) associated bronchitis; (5) constant inflammation of the smaller bronchi and bronchioles; and (6) peribronchitis and peribronchiolitis. Plugs of mucus, cell debris, and meconium are often found in the bronchioles, but pleurisy and abscess are rare. Far more numerous were cases of the septic type, where the lung tissue is for the most part fully expanded and only moderately, if at all, congested. Often this pneumonia is associated with general septicæmia. The affected lung tissue is dark red and peculiarly firm; it exudes blood-stained froth, and the bronchi contain mucopurulent exudate. Pleurisy and abscesses are often present.

Alimentary Disturbances.

Infections of the gastro-intestinal tract were rare in this series, even after a history of diarrhœa and vomiting. These symptoms are probably associated rather with a general disturbance of nutrition or a toxæmia. There were no cases of gastric ulcer and only one of duodenal ulcer, but the large intestine was ulcerated in five cases and congenitally enlarged in four. One small premature infant, the child of an eclamptic primigravida, had appendicitis, associated with generalised septicæmia. Peritonitis was present in 21 mature and 23 immature babies. One child had jaundice due to obstruction by a congenital band, and two had splenomegaly.

Central Nervous System.

There was gross intracranial hæmorrhage in 161 cases, 86 per cent. of whom died within the first week, 36 per cent. during the first day. Twenty cases showed some form of infection, while the remainder died from asphyxia and atelectasis. Five were occipito-posterior presentations, two face and brow, eight transverse, and 38 breech. In 31 the delivery was by forceps, and in 32 more there was some manipulative interference. Capillary oozing was almost universal in asphyxiated infants, and gross bleeding due to birth injury was found in 16·2 per cent. Bleeding above the tentorium may cause no symptoms, but below the tentorium it soon causes pressure on vital parts. In very premature infants the choroid plexus may bleed, and choroid thrombosis is closely related to that type of intracranial hæmorrhage which is associated with disease of the mother or sepsis in the infant. Sixty-seven of the infants with tentorial tears were mature and 64 were premature. These cases included four occipito-posterior presentations, three face and brow, six transverse, and 32 breech. Death took place during the first week in 91 per cent. and during the first day in 43 per cent., the cause of death usually being asphyxia and atelectasis. Intradural bleeding over the spinal cord is rare compared with intracranial meningeal bleeding, partly because the cerebellum, pons, and medulla act as a sort of valve to block the foramen magnum. The lumbar puncture fluid may therefore be practically free from blood, even if there is much meningeal bleeding within the skull. There is, however, usually xanthochromia. Blood may be found in the cerebro-spinal fluid, on the other hand, as a result of extradural bleeding in the spinal canal.

Meningitis occurred in 33 cases, most of the infants dying between the fifth and the thirteenth day. It was associated with septicæmia in 29 cases and with pneumonia in 12 cases. There were 17 examples of abnormality of the central nervous system.

Renal Conditions, Sepsis, Hæmorrhage, Syphilis.

Abnormalities of the kidney included: (1) congestion due to asphyxia; (2) gross hæmorrhage due to injury; (3) thrombosis and infarction associated with toxæmia of pregnancy and sepsis neonatorum; (4) degenerations of the tubular epithelium associated with infections and cachexia; (5) developmental abnormalities, such as hydronephrosis, polycystic kidney, ectopia, and calculus (one case). In no case was there any lesion that could be called nephritis, though in some feeble cachectic infants the degenerative changes justified the term nephrosis.

Cellulitis was found in 19 mature and 10 premature infants, and swabs revealed streptococci in ten cases, staphylococci in seven, and coliform bacilli in three cases. Five of the babies were delivered with forceps, three by Cæsarean section, and nine others suffered interference during labour. Abscesses were found in ten mature and ten premature infants, including six cases of pemphigus neonatorum, but umbilical sepsis was only found seven times in the whole series. The six cases of pemphigus included in the series were part of an epidemic of 15 cases, of whom seven died from general sepsis.

There were 30 cases of thrombosis; in 11 of these the mother had some form of toxæmia, and in most of the others the infant had septicæmia. Lesions were usually found in the kidney or brain. Ten infants died after severe bleeding, apparently due to a hæmorrhagic diathesis; only one of these was premature.

The Wassermann reaction was positive in 26 cases, but spirochætes were only found in six. Thus congenital syphilis is not a common cause of neonatal death. Children of syphilitic mothers, however, are often born prematurely, and seem to be particularly likely to develop sepsis neonatorum. Death was due to developmental defects and abnormalities incompatible with survival in 22 cases.

Conclusions.

Dr. Cruickshank concludes that a very large proportion of "neonatal" deaths occur during the first few days of life. Their cause is to be sought among the causes of stillbirth and the complications of labour, which cause asphyxia livida—an exaggeration of the normal congestion present at birth—and asphyxia pallida, a state of shock often associated with injury and hæmorrhage. Prematurity is a potent factor in accentuating the effects of asphyxia and atelectasis. It is often due to ascertainable causes, such as maternal disease or toxæmia, accidental or essential ante-partum hæmorrhage, ecbolic drugs, violence, or over-exertion. Infantile infection is usually acquired in the postnatal period; important predisposing factors are prematurity, asphyxia, and atelectasis, and the commonest portals of entry are the skin and respiratory tract. There is a tendency to generalised septicæmia.

Preventive measures, therefore, should include an attempt to reduce asphyxia and birth injuries by improved antenatal supervision and greater facilities for antenatal examination and the indoor treatment of obstetrical cases. Other factors are better education of medical students, graduates, and midwives; the reduction of prematurity by more stringent control of ecbolic drugs, and the reduction of neonatal

infection by improved hygienic and housing conditions, and the provision of more hospital accommodation with adequate nursing staff.

Recent Advances in the Treatment of Asphyxia Neonatorum.

In an appendix Dr. Cruickshank sums up as follows the main points in the treatment of asphyxiated new-born infants: (1) the avoidance of all violent attempts at resuscitation; (2) the provision of absolute rest, warmth, and quiet; (3) the immediate toilet of the air passages so as to remove mucus, meconium, and liquor amnii; (4) the supply of oxygen together with 5 per cent. carbon dioxide in regulated doses; (5) the withdrawal of cerebrospinal fluid in cases of high intrathecal pressure and intracranial bleeding; (6) the maintenance of an adequate fluid intake by gavage until the infant is able to take the bottle; (7) care of the skin and accessible mucous membranes, but the avoidance of bathing until normal breathing and sucking power are established.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

Registration of Dentists in Bombay.

A BILL for the registration of dental practitioners in the Bombay Presidency has been drafted by the Government, and is now under consideration. The Bill provides for the establishment of a dental board, composed partly of members of the medical council, partly of dentists, the board to be associated with the medical council, which would exercise disciplinary powers over dentists as well as medical practitioners. Following the British precedent, provision is made for the registration, at the outset, of dentists who hold no diploma but can satisfy an examining body of their fitness to practise. They would be termed simply "dentists," while those who hold recognised qualifications would call themselves "dental surgeons." The draft has been criticised on the ground that it is not advisable for the dental board to be established under the ægis of the medical council; feeling is strong among qualified dentists that it should be an independent body. If Bombay is to have the distinction of being the first presidency to establish a dental register, the credit will be largely due to Dr. J. J. Mody, professor of dentistry at the Grant Medical College, who has worked tirelessly to this end, and has already started a dental hospital. The practice of dentistry in India is chaotic, and it will be uphill work to place it on a proper footing. Not the least of the initial difficulties will be the paucity of qualified practitioners and the absence of facilities for training. With the provision of the essential minimum of hospital and school equipment, however, and granted adequate public spirit amongst the small body of available practitioners, it ought to be possible to make a start. Unlike medicine, with its indigenous *vaids* and *hakims*, dentistry has no native Indian exponents, apart from the people who call themselves "tooth-binders," and earn a precarious living by ingeniously tying loose teeth to adjoining sound ones. There are, however, already a number of irregular practitioners on western lines who will have to be eliminated.

The Sarda Act.

The coming into force of the Act to prohibit child marriage has aroused much interest. Minor boys and girls have been married in surprisingly large numbers during the last few weeks, in order to forestall the Act, and instances have occurred of children only a few days old being snatched from nursing homes to be united in the bonds of matrimony. The *Times of India* tells of a girl of three, who was sound asleep in bed when her presence was required for the ceremony, and asked on being awakened that it might be put off until the morning. It remains to be seen whether the new ordinance will be defied on a large scale; a large and influential section, however, of public opinion supports the movement, and experience of other measures of social reform justifies the belief that the measure will eventually be generally accepted as inevitable. An encouraging sign is the enthusiasm of women on the subject. Speakers at the recent All-India Women's Conference in Bombay, and similar gatherings in other parts of the country, have expressed emphatic approval of the Act, and of a Bill which is shortly to be introduced in the legislative assembly to put an end to the practice of dedicating young girls to Hindu temples. At a time when Mr. Gandhi is being denounced as a mere political schemer, it ought to be remembered that the revival in favour of these social reforms is due to propaganda carried on unceasingly by the Mahatma during many years. Child marriage is one of the evils he has constantly attacked.

Vaccination.

It is unfortunate, however, that the Mahatma's recent prejudice against almost everything of western origin has led him to fall foul of important sanitary measures. One of these is vaccination which, of course, plays an even more beneficent part in India than in Europe, and has saved countless lives. It is impossible to argue with him since he attributes many of his views to the promptings of an Inner Voice. The Voice, says the *Times of India*, has now informed him that it is sheer irreligion to resort to vaccination as a preventive against small-pox; it is as bad as eating cow's flesh. This article of faith was recently tested severely when three children belonging to his Ashram near Ahmedabad died one after the other of small-pox, but his conviction remained unaltered. He asks, "if I were to be frightened by these three deaths, of what use would be my faith in God? In the fight that is impending not three but thousands and hundreds of thousands may perhaps have to be sacrificed." And he suggests that this trial has been sent to harden his heart for the civil disobedience struggle.

Bacteriophage in Cholera.

Lieut.-Colonel J. Morison, I.M.S., director of the Medical Research Institute of Shillong (Assam), has had an opportunity of testing d'Herelle's cholera bacteriophage in a hill village epidemic. The outbreak occurred in virgin soil, and the mortality from the first was maintained at a high level, on the ninth day no fewer than seven out of nine persons attacked dying. It is stated that with the introduction of bacteriophage treatment there was at once a change, and Colonel Morison evidently thinks that the treatment was effective. He was associated with Dr. d'Herelle in the early stages of his work in India, and the record of his work in the March issue of the *Indian Medical Gazette* is worthy of study.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Hospitals and Sweepstakes.

THE proposal to legalise the holding of sweepstakes on behalf of charitable hospitals in the Irish Free State has given rise to considerable hostile criticism, and the Bill for the purpose is at present at a standstill. Many religious bodies in particular have been decisive in their disapproval. Last week, however, Sir William Taylor, speaking at the annual meeting of the Coombe Hospital Linen Guild, defended the proposal. He pointed out that, on a conservative estimate, the Dublin hospitals were in debt to the extent of some £130,000. It would take as much more to bring them up to modern requirements. The hospitals had explored every avenue of income, but the fact was that people had not got the money to give. The only means left to the hospitals was the sweepstakes. He did not think there was anything immoral in raising money in this way. Sir William received an unexpected ally in the Very Rev. John

Hannon, S.J., who said that he thoroughly agreed with Sir William's ethical exposition. He knew no ethical reason why sweepstakes should be forbidden; he had nothing but commendation for them if they were not pressed too far. No doubt critics will still ask how, if it is true, as Sir William Taylor says, that people have not got money to give to charity, they still have money to spend on gambling.

The Appeal for Radium.

The Irish Radium Institute, which works in association with the Royal Dublin Society, has recently issued an appeal for funds to purchase an additional supply of radium. Several generous persons have promised guarantees, amounting at present to over £5000, to contribute in equal proportions to sums subscribed in answer to the appeal. It is hoped that at least £12,000 in all may be forthcoming, a sum sufficient to buy one gramme of radium. The radium at the disposal of the Irish Radium Institute is mainly used in the production of emanation which is supplied to surgeons as a therapeutic agent. The Institute rightly takes pride in the fact that the mode of using radium emanation by means of hollow needles, now commonly employed throughout the world, was devised by its workers many years ago. It is to be hoped that the appeal recently issued will meet with a generous response.

A Tribute to Dr. E. C. Thompson.

A tablet has been erected in the Tyrone County Hospital, Omagh, by the hospital board as a tribute to Dr. E. C. Thompson, D.L., who was surgeon to the hospital from 1875 to 1928. The tablet, in addition to appreciative references to his skill, energy, and sympathy, states that "the very existence of the Hospital in its present up-to-date structure and internal condition is largely due to his efforts."

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Health Examinations in New York.

THE first campaign for the promotion of periodic health examinations undertaken by the Five Counties Medical Societies of New York was forecast in a previous letter. It was actually launched last November by proclamation of the mayor. One and a half million leaflets, 21,000 posters, 5000 counter cards were distributed; 30 radio talks and 30 public lectures on periodic health examinations were given; and hundreds of columns of comment appeared in the daily press. The six months' campaign was so successful that a new campaign has been authorised to extend over a full year at a cost of $30,000. Some new features are now to be introduced. These include an investigation of the health educational work now being carried on by industrial and voluntary associations. It is hoped thus to improve the methods of popular education. At the same time an attempt will be made to standardise the health examination in a form that will enable the general practitioner to give the best possible service to his patients. The findings of the research committee will be presented to medical schools in the hope that they may be included in the curricula. To assist physicians in conducting the examinations a monthly bulletin will be issued. Health examination clinics will be held in hospitals and other institutions. The five county societies include a membership of 12,000 physicians.

A Symposium on the Kidney.

The University of Minnesota is organising a short summer course to be held from July 7th–18th on the anatomy, physiology, and pathology of the kidney. No attempt will be made to present the whole wealth of accumulated knowledge on these subjects, but the discussions will rather centre upon recent advances and on those phases of the subject where advance is most difficult and where intensive investigation is proceeding at the present time. A very strong faculty has been assembled, including, besides members of the university, visiting professors from Johns Hopkins and other universities, and from the Mayo Clinic. Prof. Franz Volhard, of Frankfort, will conduct a series of clinics. Several evenings have been set aside for round-table discussions.

Causes of Death from Burning.

The New York State department of health has made an analysis of the causes that led to 314 deaths from burning during the year 1928. More than a quarter of the deaths (27·4 per cent.) were of children under 5 years of age and another tenth were of children from 5 to 9 inclusive. Most of the deaths from bonfires and all of the deaths from matches occurred in these two age-groups. The largest proportion of deaths, but not more than 29 per cent., occurred in burning buildings. The following table shows the number of deaths by age as well as by the responsible agency:

Agency.	Total.	Age in years.		
		Under 5.	5–9.	10 and over
Total burns	314	86	34	194*
Bonfires	22	8	6	8
Corrosive substances	4	—	—	4
Lamps	3	—	—	3
Matches	14	9	5	—
Stoves	59	11	2	46
Scalds	52	37	4	11
Conflagrations (burning buildings)	91	13	8	70*
Other specified means	57	5	6	46
Means not specified	12	3	3	6

* Includes two deaths with age unknown.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 26TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox 353 (last week 345); scarlet fever, 1885; diphtheria, 1175; enteric fever, 69; pneumonia, 1014; puerperal fever, 55; puerperal pyrexia, 98; cerebro-spinal fever, 11; acute poliomyelitis, 7; encephalitis lethargica, 7; dysentery, 6; ophthalmia neonatorum, 106. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on April 29th–30th was as follows: Small-pox, 483 under treatment, 31 under observation (last week 542 and 26 respectively), scarlet fever, 2060; diphtheria, 2635; enteric fever, 27; measles, 1055, whooping-cough, 63; puerperal fever, 30 (plus 16 babies); encephalitis lethargica, 119; poliomyelitis, 1; "other diseases," 19. At St. Margaret's Hospital there were 15 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns including London there was 1 death from small-pox, 3 (0) from enteric fever, 125 (58) from measles, 16 (5) from scarlet fever, 30 (5) from whooping-cough, 27 (4) from diphtheria, 48 (15) from diarrhœa and enteritis under two years, and 48 (4) from influenza. The figures in parentheses are those for London itself.

The death provisionally classified to small-pox was assigned to Finsbury (Met. Boro.). (Another occurring in Nuneaton U.D. during March has now been returned.) The 3 deaths from enteric fever outside London were reported from Enfield, Bootle, and Sheffield. Fatal cases of measles were still widely distributed, with larger numbers at Salford 6, West Ham and Warrington each 5, Willesden and Darlington each 4. Whooping-cough claimed 4 victims at Liverpool and 3 at Manchester. Deaths from diarrhœa numbered 5 at Liverpool and 4 at Manchester. Birmingham and Manchester each reported 4 deaths from influenza.

The number of stillbirths notified during the week was 321 (corresponding to a rate of 46 per 1000 births) including 54 in London.

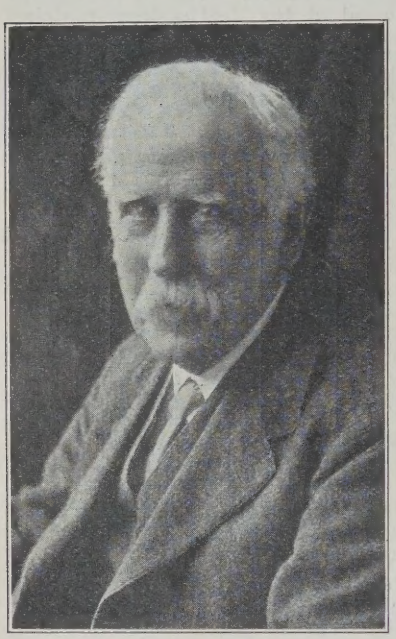
Obituary.

SIDNEY COUPLAND, M.D., F.R.C.P. LOND.,

CONSULTING PHYSICIAN TO THE MIDDLESEX HOSPITAL; LATE MEMBER OF THE BOARD OF CONTROL.

WE regret to announce the death of Dr. Sidney Coupland, which occurred at his house, Wootton Ridge, Boar's Hill, Oxford, on Tuesday, April 29th, in his eighty-first year, after more than a year of complete invalidism.

Sidney Coupland was born in December, 1849, and was the third son of Mr. W. N. Coupland, of Streatham. The family consisted of three sons and four daughters, and the father having met with unmerited business reverses the brothers had to make their own way and coöperate in the support of the family. Sidney Coupland received his early education at Hove House School, Brighton, and proceeded as a medical student to University College Hospital, where the teaching staff included such well-known men as William Jenner, Russell Reynolds, Ringer, Bastian, John Williams, Erichsen, and Christopher Heath. He graduated with honours at the University of London in 1873, and in the next year took the Membership of the Royal College of Physicians and proceeded to the M.D. London. At University College Hospital he held the various resident posts, but he did not wait until a vacancy occurred on the staff but migrated to the Middlesex Hospital, where he was appointed pathologist in 1873, becoming in 1875 assistant physician. On the Middlesex Hospital medical staff he was soon recognised as a sound clinician and an earnest and sympathetic teacher. For a considerable period he was medical tutor in the school, while he edited for four years the medical and pathological reports of the hospital. He lectured on pathology and pathological anatomy and took classes in the wards and out-patient department, where his instruction was recognised as of high practical value. In 1879 he obtained charge of wards, in 1880 he was elected F.R.C.P., and in the following year he delivered the Goulstonian Lectures, which took the form of an elaborate disquisition on anæmia, and in which the general lessons were mostly derived from a study of practice at the Middlesex. He was physician to the Middlesex Hospital for 19 years and during this period he was recognised by his colleagues as a general consultant in the fullest sense of the words. Nevertheless the large range of his clinical work never induced him to write a medical treatise, but his contributions to serial medical literature were considerably numerous, and he published a brief monograph on endocarditis, and some practical notes on the clinical examination of blood and excreta, which were a résumé in relation to his teaching when conducting the autopsies at the hospital. An appreciation of Dr. Coupland is appended from the pen of Sir John Bland-Sutton, and from this the great influence can be gauged which Coupland exercised at Middlesex as learned physician and sympathetic teacher.



DR. COUPLAND.

[*Photograph by Lafayette.*

From 1889 to 1896 Dr. Coupland was engaged in making reports on various small-pox outbreaks to the Royal Commission on Vaccination, which it may be remembered took evidence for six years after its appointment in 1889. This work made him thoroughly conversant with every side of the vaccination question, and we owe to Sir William Collins, the only surviving member of that Commission, the following account of Coupland's services, with a testimony to his other fine qualities.

Sir William Collins writes:—"As the only survivor of the Royal Commission on Vaccination which sat under Lord Herschell's chairmanship in 1889–96, I wish to testify to the value of the services rendered to that Commission by the late Dr. Sidney Coupland. He not only investigated with great care and impartiality outbreaks of small-pox at Dewsbury, Leicester, and Gloucester, but he also examined and reported on numerous cases of untoward results alleged to have been due to vaccination. Without fear or favour, but simply as the painstaking and accomplished clinical physician that he was, he recorded the conclusions at which he had arrived, irrespective of the partisan contentions which have always encumbered this much vexed question. He commended the 'sanitary vigilance' at Leicester, and attributed to it the restricted spread and the lower fatality experienced there compared with the cases of Dewsbury and Gloucester, where sanitary conditions and hospital provision and organisation were less satisfactory or less adequate. He classified the injurious results from vaccination into those due to the quality of the lymph, those caused by septic infection, and a third category described as 'cases of deranged health, and even serious symptoms evolved by the constitutional disturbance induced by vaccination in weakly or predisposed subjects.' In reference to these latter he suggested that 'unless small-pox were prevalent at the time it might often be preferable to defer vaccination for several months than to adhere too rigidly to the statutory age, irrespective of the condition of the child and its surroundings.' He also deprecated 'the vaccination of very young infants, as is the practice in regard to workhouse children and those born in lying-in institutions.' The relaxations of the compulsory law which have resulted from the Commission's labour were, it is understood, in harmony with the conclusions at which he had arrived.

Besides his official association with Dr. Coupland it was my privilege to enjoy his friendship for more than 40 years. Coming from a Liberal, non-conformist stock, he was alike in professional and other matters ready to listen to any opinion, but determined to judge for himself. Like his brother, Dr. W. C. Coupland, he brought a broad philosophic outlook to bear on all the problems which he encountered, and if from a rather diffident manner casual observers might misjudge him, to those who knew him well he was a true-hearted friend of firm and sterling quality. He was, moreover, a deeply religious man, though devoid and disdainful of affected piety, and he was successively the admirer and supporter of the Rev. Stopford Brooke and of the Rev. John Hunter, of Glasgow."

It was characteristic of Coupland that he should do the spade-work in connexion with movements in which he was interested, and bodies to which he belonged. Thus he was at different times hon. secretary to the Pathological Society, the Clinical Society, and the Epidemiological Society, and occasionally contributed to the debates, always pertinently though with an air of wishing to conceal his knowledge.

On the fulfilment of his period of office as full physician to the Middlesex Hospital he was elected consultant physician, and was simultaneously appointed a Commissioner in Lunacy. This post he held from 1898 to 1914, when, on the institution of the Board of Control, he became a member of that Board, finally retiring from the service in 1921 after a period of more than 20 years' work in the department. One year later Coupland delivered the Harveian Oration before the Royal College of Physicians of London, when he divided an eloquent discourse into two parts; in the first he revived the personality of Harvey for the audience through the reminiscences of Aubrey, while in the latter part of the Oration he dealt with modern progress in the treatment of the insane and the more intelligent study of insanity which marks the psychology of to-day. Probably it was Coupland's high sense of the responsibility of an official position which prevented him recording any of his experiences while in State employment, just as, save in the columns of THE LANCET, he made no public mention of his investigations intended for the Commission on Vaccination. But in the Harveian Oration will be found an eloquent plea for the removal of the stigma which attached, and which still attaches, in the popular mind to the mental patient, insisting on the ill influence of such prejudices as they stand in the way of the diagnosis, and thus of the cure of the early phases of mental disease.

To this brief epitome of Coupland's valuable career a record must be added of his intimate connexion with THE LANCET. Coupland formed the fourth of a small body of advisers who took over the conduct of this paper during the long illness of Dr. James Wakley, the other three being Sir John Tweedy, Surgeon-General Marston, and James Grey Glover. James Wakley succeeded his father, the founder of THE LANCET, in the editorial chair while still a young man, and throughout his career was particularly dependent on his staff. During the closing years of James Wakley's life, and for the next ten years, Coupland was the principal adviser on medicine generally to the succeeding editors, Thomas Henry Wakley and his son the third Thomas Wakley. In that capacity his industry was as noticeable as were his discretion and his wide range of knowledge. He wrote with facility and clearness and especially with a full sense of the importance of the judgments which he was asked to make, and his leading articles form a résumé of clinical progress in the 'eighties and early 'nineties, while his critical estimates of medical literature were rarely found at fault.

Sir John Bland-Sutton writes:—"The death of Sidney Coupland, my friend and former colleague at the Middlesex Hospital, recalls the condition of staff appointments in London hospitals and medical schools 50 years ago. Coupland was trained at University College Hospital, and like many of his friends elected to come to the Middlesex Hospital, where in those days the teaching appointments in the school were held by members of the hospital staff. The apportioning of the lectureships was made on definite lines. In medicine the physicians taught the principles of medicine, the assistant physicians made the post-mortem examinations, taught pathology, and were, each in turn, curators of the museum. I first met Coupland in the post-mortem room, and our relations soon became close. I attended the dead house regularly because he took great trouble in demonstrating the specimens, and in those early days of my hospital career—before surgeons had become familiar with abdominal surgery—the revelations post mortem were of the utmost advantage to men keen on diagnosis. Coupland was not only skilful in conducting an autopsy, but being curator of the museum he prepared specimens exceptionally useful for teaching purposes, or of intrinsic interest for permanent preservation. In this indirect way I obtained special experience in museum technique. Coupland, like his immediate predecessor, William Cayley, was keen in studying cardiac lesions—inherited or acquired—and added a fine series of hearts with valvular lesions to the museum. He did not preserve specimens simply because they were rare, but always with an eye to their utility for the lecture room and for class purposes. In addition, he described the specimens and added the clinical notes in his peculiar but perfectly legible handwriting in the museum catalogue. The same care that he devoted to the pathological department he manifested in the wards.

He was a sound physician, without bombast or conceit; he taught his clinical classes the methods of investigating a 'case,' the manner of using special instruments, ophthalmoscope and laryngoscope, as well as the stethoscope, how to conduct the microscopic examination of urinary deposits, and the estimation of sugar, and the significance of the findings. Being specially interested in the problems of anæmia his clinical clerks soon became expert in the methods of counting blood corpuscles. Anæmia and leukæmia were disorders in which he took great interest. Thus Coupland's practical classes in the wards were of the greatest service to the students. He was most patient in teaching, whether it concerned clinical examination, note-taking, or writing prescriptions. A gross blunder on the part of the student did not evoke any rude outburst or banter, but simply a peculiar nervous titter! In respect of surgical treatment he was progressive, and the surgery of cranial, thoracic, and abdominal diseases equally attracted him. In 1880 he had a young woman under his care in whom he diagnosed a renal calculus, and induced his surgical colleague, Henry Morris, to remove the stone. The surgical intervention was successful. This 'case' is historical; it laid the foundation of renal surgery as we understand it to-day. I was present at the operation, and M. M., the patient, lived many years, and reported herself at the hospital from time to time. As the years rolled on I became Coupland's co-relative surgeon in the hospital, and I remember that he transferred a groom to my ward with an 'iliac swelling.' I operated on the man and removed his vermiform appendix; this was the first example of 'appendectomy' in the history of the Middlesex Hospital.

Sidney Coupland, conscientious as a teacher, was highly self-conscious as a physician; his apparent timidity was inimical to success in dealing with private patients, especially female patients. He disliked strife, was loyal to his colleagues, and devotedly attached to his adopted hospital."

Dr. Sidney Coupland married in 1880 Bessie, daughter of the late Mr. Thomas Potter, of Great Bedwin, Wilts, who survives him at the age of 83, and within measurable distance of their golden wedding. Their marriage was one of unbroken devotion. Prof. Reginald Coupland, Beit Professor of Colonial History at Oxford, is the only surviving son, an elder brother having died as a child from diphtheria, to the abiding grief of the parents.

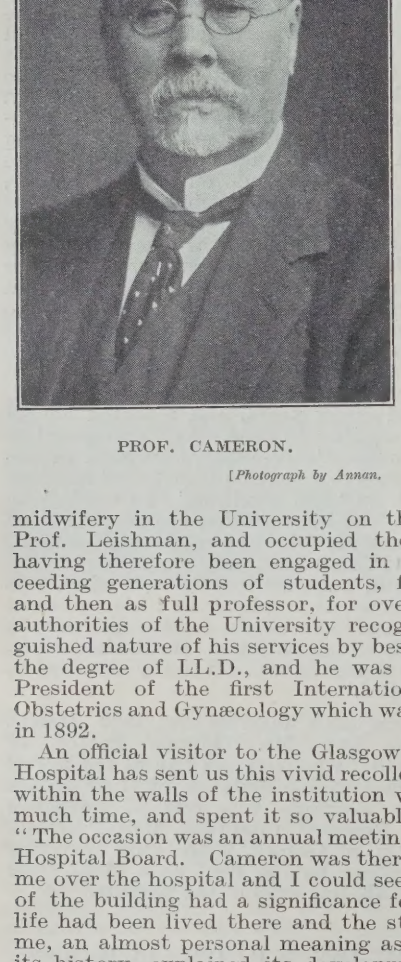
MURDOCH CAMERON, M.D., C.M., LL.D. GLASG.,

LATE REGIUS PROFESSOR OF MIDWIFERY AND DISEASES OF WOMEN, UNIVERSITY OF GLASGOW.

WE regret to announce the death of Prof. Murdoch Cameron, which took place on April 28th in a nursing home in Glasgow in his eighty-fifth year.

Murdoch Cameron, the son of a merchant in Glasgow, was educated at his native University, where he graduated in medicine in 1870, proceeding to the M.D. degree two years later. He made midwifery a study from the beginning of his career, his first post, which was obtained over 50 years ago, being that of physician to the University Lying-in Hospital. In 1878 he was appointed physician accoucheur to the Western Infirmary, having in the meantime become assistant to William Leishman, the well-known Regius Professor of Midwifery in the University, and father of the late Sir William Leishman. In 1888 Murdoch Cameron obtained

the appointment with which his memory will always be associated, namely, that of obstetrical physician to the Glasgow Royal Maternity Hospital, and it was here that he made his reputation as a progressive obstetrician. He found a large and varied clinical field the cultivation of which gave exercise to his boldness, ingenuity, and practical learning. His name was closely associated with Cæsarean section, owing to certain successful operations conducted upon rickety subjects 40 years ago, the introduction of antiseptics allowing for the revival of procedures which had been abandoned because of their fatality; here Cameron's actual training under Lister at the Royal Infirmary—a fact which he recorded in the Lister Centenary celebrations—stood him in good stead.



PROF. CAMERON.

[*Photograph by Annan.*

In 1894 he succeeded to the chair of midwifery in the University on the resignation of Prof. Leishman, and occupied the post till 1926, having therefore been engaged in lecturing to succeeding generations of students, first as assistant and then as full professor, for over 40 years. The authorities of the University recognised the distinguished nature of his services by bestowing upon him the degree of LL.D., and he was elected honorary President of the first International Congress of Obstetrics and Gynæcology which was held in Brussels in 1892.

An official visitor to the Glasgow Royal Maternity Hospital has sent us this vivid recollection of Cameron within the walls of the institution where he spent so much time, and spent it so valuably. He writes:—"The occasion was an annual meeting of the Maternity Hospital Board. Cameron was there waiting to show me over the hospital and I could see that every stone of the building had a significance for him. His real life had been lived there and the structure took, for me, an almost personal meaning as he held forth on its history, explained its development, and showed photographs of early cases. Among these were three cases of Cæsarean section, the first, I understood, to be done in the hospital, if not in Glasgow. The awful history of maternal rickets in Glasgow later made the operation frequent when Cameron's pioneer message was understood. Cameron was full of enthusiasm, which age had not abated (and he was no longer young). When we came to the room where the new-born were first taken to be handled and dressed, he said, as the nurses were coming in twos or threes: 'That's the music!' and then, like a young resident, explained the method of ordering the new babies and labelling them for restoring to their mothers at the correct moment. It was the talk of a man whose whole soul was touched with the successful management of new life and the preservation of the mother."

Prof. Murdoch Cameron was predeceased by his wife for over 30 years, and is survived by one son, Dr. Samuel Cameron, who is obstetric surgeon to the Glasgow Maternity Hospital, and four daughters, one of whom, Dr. Agnes Cameron, is physician to the Stobhill Hospital, while another daughter is matron of the Stirling Maternity Hospital.

EDWARD LAW, M.D. EDIN.,

CONSULTING SURGEON TO THE LONDON THROAT HOSPITAL.

WE regret to record the death of Dr. Edward Law which occurred at Hove on Wednesday, April 30th, in the seventy-sixth year of his age. For many years he occupied a leading place in London as an otologist, and this position was equally allotted to him on the Continent and in the United States. The long period of ill-health which marked his later life has, perhaps, obscured the memory of a distinguished man.

Edward Law was born in 1853, the son of Abraham Law, of Sheffield, and received early education in his native city and his medical training in the University of Edinburgh, where he graduated as M.B., C.M. in 1877, taking the M.R.C.S. Eng. at the same time. After holding certain resident appointments he decided, for health reasons, to accept an appointment as surgeon in the Pacific Steam Navigation Company, and later became a medical officer in the Orient and City Lines, making up a period of some three years in which he was a ship's doctor. He then commenced to practise in Australia, where he resided for two years, at the end of which period, his health having recovered, he decided to return to Europe and to specialise in otology. With this object he spent three years in Vienna where Politzer and other workers along the same line had made their clinics celebrated, and during this period he not only acquired a practical knowledge and expertise that few otologists and laryngologists in this country at the time possessed, but he became a real German scholar and a personal friend of many of the professional leaders in the Austrian capital. He returned to England in 1883 and became house surgeon at the Throat Hospital in Golden-square, where Morell Mackenzie was the leading figure, but in 1887 the London Throat Hospital was founded, and Law, one of the originators of the scheme, became a member of the staff.

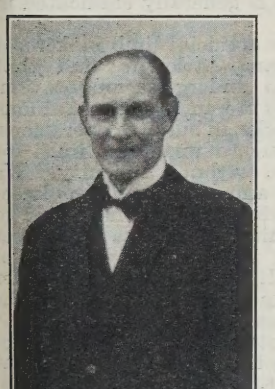
We are indebted to Dr. E. B. Waggett for the following personal estimate of Law as doctor, colleague, and friend. To the sympathetic picture any addition would be superfluous. "For one of his junior colleagues on the staff of the London Throat Hospital which he had helped to found, the outstanding memory of Edward Law is that he possessed the strange faculty of authority; his dictum upon the prognosis of a case of deafness or upon the desirability or otherwise of operation was accepted without question, and the opinions which he expressed at the meetings of the medical societies were always listened to with respect. To-day with the accumulation of 30 years of research and of clinical experience, coupled with precise methods of scrutiny, it is difficult to recall the nature of personal authority; there is no question but that Law exhibited that faculty, and that fact is evidence that he knew all that was known up to date, that he took infinite pains in arriving at an opinion, that he was a close and accurate observer, and that his judgment was both alert and balanced. As the scope of otological knowledge grew he kept up to date (I have by me now his attempt to render intelligible the elaborate work of Barany on the labyrinth), and until his retirement a year or two before the war Law's opinion was sought and accepted in problems where clinical tests had proved indecisive. In a word, Law was an exceedingly good doctor, with the result that he acquired the complete confidence of colleagues throughout the world, and enjoyed a very large and important practice. For reasons of health he took no active part in the development of operative surgery, although during his time at Vienna he had

gained a reputation for unusual skill with the chisel. This fact, coupled with a disinclination for uninvited self-assertion, probably robs him, in the eyes of the rising generation, of the prominent place which he took as a pioneer of precise otology in Great Britain—a place which is certainly accorded him by the generation which was brought up on his translation and edition of Gruber's 'Diseases of the Ear,' the recognised text-book on the subject in this country for many years.

"If Law was an example of the best type of doctor, the man who devotes all his consideration and all the knowledge available to the welfare of his patient, he was also the best of colleagues and the best of friends. Many of his juniors must be able to recall personal experiences of the working of his generous nature; clinical difficulties surmounted by his unostentatious advice; credit due to his judgment thrust by him upon their shoulders; the confidence of patients restored where cases threatened to go awry. Before ill-health overtook him nearly 20 years ago, Law was vivacious, witty, a good sportsman, and the centre of a circle of close friends both in and outside the profession. All this does not account for the affection he inspired in his closest friends and in a remarkable degree in his old patients. Those who knew him well will agree that in some singular fashion he was a particularly lovable person; he was kindly, courteous, straightforward, a staunch ally, and completely unselfish, but I think that his peculiar attraction must lie in his capacity for loving his friends."

HUBERT JOHN BURGESS FRY, M.D., B.Sc. Oxf., D.P.H.

Dr. H. J. B. Fry died on May 5th, having been ill only for two or three weeks. He was a pathologist of standing who for the last eight years had specialised in cancer research and had taken a prominent part in the organisation and activities of the British Empire Cancer Campaign. Dr. Fry was born in India in 1885, and educated at Charterhouse, Magdalen College, Oxford, and St. Thomas's Hospital. He was a distinguished student, obtaining an exhibition in science at his school and at his college, and taking a degree in natural science with first-class honours in physiology. After graduating he was appointed to a university biological research scholarship at Naples, and worked there at the thesis which gained him his B.Sc. He returned to England and attached himself to St. Thomas's Hospital, whence he graduated in medicine in 1911, taking his M.D. in 1914. He became resident house physician and then casualty officer at the hospital, and served as clinical assistant in four different departments before he specialised in pathology, becoming demonstrator and Jenner Research Scholar, and later assistant director of the pathological department. On the outbreak of the war he joined the R.A.M.C. (T.), and served in France for some time as a regimental medical officer and at a casualty clearing station. He was mentioned in despatches and later was withdrawn to the base to do special pathological investigations, notably in influenza and on the treatment of septicæmia. For four years after the war Dr. Fry worked as bacteriologist in the Central Laboratory of the Ministry of Pensions, and in 1922, when the pathological departments of the Cancer Hospital, London, were being reorganised, he was appointed pathologist to the Research Institute of this hospital. Realising the importance of reliable tests for the diagnosis of cancer, he began an investigation into the various serological tests which had been described and developed a new flocculation test which gave a high percentage of correct results when applied to cases of cancer. He made no claim that the test was specific for cancer, but with characteristic thoroughness and caution he studied the conditions responsible for the reaction. He found that they were due to cellular degeneration, and could demonstrate that if certain other conditions associated with cellular degeneration, such as syphilis and tuberculosis could be excluded, the test was a valuable aid to the diagnosis of cancer. The advances made by the experimental study of carcinogenesis attracted his attention to the relation of trauma to cancer, and at the International Cancer Conference held in Paris in March, 1930, on the occasion of the opening of the new cancer centre in Villejuif, he communicated the clinical material which he had collected bearing on the question of cancer arising in the scars of war wounds. Dr. Fry served on several committees of the British Empire Cancer Campaign, and was largely responsible for organising the International Cancer Conference held in London, in 1928. He was a member of the Editorial Committee of the *Cancer Review* from its inception, and the standing which this journal has acquired during the five years of its existence is largely due to his efforts.



DR. FRY.

Soon after his appointment to the Cancer Hospital, Dr. Fry left London to settle in Welwyn Garden City, where his wife, Dr. Gladys Miall Smith, started in general practice. He took an active interest in the development of garden city ideals, and was a popular and prominent member of the local community, becoming a J.P. of the county of Herts.

The honesty of his purpose and the charm of his personality endeared Dr. Fry to all who came into contact with him, and wide sympathy will be felt with his widow and children in their loss.

Prof. Archibald Leitch writes:—"Our minds are benumbed by the loss of our dear friend and colleague. Everybody who had any acquaintance with him would realise his outstanding qualities and those of us who were in constant association with him regarded him with affectionate admiration. He seemed to have all the good qualities. Though uncommunicative about himself he had a charming genius for friendship, and though he held strong views on politics and social affairs no one could possibly quarrel with him. He was sincere and he was thorough in everything that he did. It was fortunate for me to gain his friendship during the war and doubly fortunate to get him as a colleague afterwards. His published papers indicate the scope and the extent of his laboratory work but they represent only a fraction of his investigations. He crowded more into a day than anybody else I knew. When there was a temporary lull in the work of the pathological laboratory he filled the time with experiments in the animal room, mainly on immunology, or he made abstracts from foriegn scientific literature, or he attended a committee meeting. His life was strenuous but never hurried. The municipal affairs of Welwyn Garden City, where he was a magistrate, occupied some of his evenings. On Saturday afternoons he played football, hockey, or tennis, or he rode a horse; he was an all-round athlete—a good cricketer, a good swimmer. I used to tell him in a chaffing way that he ought to give up Association football at his time of life, for he was 44, but he was physically strong and apparently fit. I wonder if he did not tax his energies too much, so that when an acute illness came it found a tired body. His scientific abilities were great, but far more than that, he was a real man."

The portrait is from a group photograph taken at the Paris conference in March.

THE LATE MISS M. B. WILLIAMSON.

THE Royal Society of Medicine owes a debt of gratitude to Miss Williamson, who was attached to its secretariat for over 30 years. It was in 1904 that she joined the permanent staff of the Royal Medico-Chirurgical Society under Sir John MacAlister, to whom she had already acted for several years as temporary assistant. Three years later the Royal Society of Medicine was founded, and through the crowded and difficult times of preparation, negotiation, and completion Miss Williamson was the right hand of the secretary and honorary officers. Again in 1911, when the new house at 1, Wimpole-street was being built, and in the following year when the books and other effects were being transferred there from 20, Hanover-square, it was on Miss Williamson that the organisation fell. And finally, when in the war period of 1914–18, many of the staff and honorary officers were on active service, her unflagging energy and cheerfulness carried through tasks which might well have discouraged a less ardent spirit. In 1925 a special resolution of gratitude and appreciation was passed by the Council for her fine service, and it was fitting that the memorial portrait of Sir John MacAlister should have been unveiled by her hand.

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Dr. Donald Davidson's death at Plymouth, where he was port medical officer, cuts short a promising career in the public health service. He qualified from King's College, London, in 1922, and had recently taken the highest medical qualifications. His contributions to the *Medical Officer* showed uncommon wit and wisdom, and his loss is felt among a wide circle of friends.

Correspondence.

"Audi alteram partem."

A UNIVERSITY DEGREE FOR THE GENERAL PRACTITIONER.

To the Editor of THE LANCET.

SIR,—The correspondence in your columns on this subject encourages me to make an appeal on behalf of a smaller band of medical men who find themselves the victims of the very rigid and unreasonable regulations of the London University. Every year a number of colonial students, many of whom have completed their pre-clinical training at a Dominion university, arrive at this world centre to pursue their hospital training. Many of them are unaware of the obstacles that await them in the way of non-recognition of their colonial matriculation or their qualifying examinations in the pre-clinical subjects (I was completely misguided by the dean of one of the largest medical schools in London with whom I had corresponded from abroad), whilst others decide to proceed with the Conjoint diploma, not recognising at the time the full significance of a medical degree, or being forced that way by financial considerations.

The general practitioner feels the loss of a degree only mildly as his patients are little concerned with his academic qualifications, but the would-be consultant and the man interested in public medicine finds an almost insuperable barrier and he is irrevocably doomed to the restricted field of a non-university man. Even the M.R.C.P. qualification which, when combined with the M.B., B.S. of a recognised university, constitutes the open sesame for the more desirable hospital posts is usually quite ineffectual in itself.

That the M.D. London should be attainable on the standard suggested by "M.D., M.R.C.P." would mean a definite lowering of the status of the degree such as would be undesirable. Exemption from the Matriculation examination and the first and second qualifying examinations, however, could be and should be granted more readily upon presentation of other qualifications or indications of an acknowledged standard, not necessarily university degrees, permission being granted to sit for the final examination for the M.B., B.S. in the ordinary way, from which the M.D. or the M.S. would be obtainable.

Life is too short to allow one to return for two or three years to the dissecting room and the laboratory, but six months of study which gave promise of a university degree of standard would be acclaimed by all who were eager to gain that status.

I am, Sir, yours faithfully,

May 4th, 1930. M.R.C.P. Lond.

AMPUTATIONS AND ARTIFICIAL LIMBS.

To the Editor of THE LANCET.

SIR,—The report in your issue of April 12th (p. 807) of the discussion at the Section of Surgery of the Royal Society of Medicine is of special interest to those who recognise the value of the opinions of surgeons at Roehampton who have seen the after-results of thousands of amputations. Artificial limb makers will welcome an opportunity of noting the effects of amputation in war cases and comparing them with similar operations in civilian cases. This applies with emphasis to the value of the Syme, Stokes-Gritti, and other operations through knee- or ankle-joint. It was probably impossible for surgeons to give definite statistics of the number of these cases which required reamputation during the succeeding ten years, but in civilian cases the problem is very different. In war cases the Syme amputation was largely a sequel of gangrene from frost-bite, and in the knee-joint amputations there were complications from sepsis. The original amputations were often hurriedly done, involving subsequent operations. In civilian cases, on the other hand, complications are only to be feared in cases of tuberculosis, and at the present day the trouble is generally eradicated in the amputation.

From our own records as artificial limb makers, of a hundred cases of Syme amputation we find that not a single case had to undergo reamputation, and the wearers of the limbs are undertaking arduous duties on railways, at the docks, in building operations, and so forth; they continue to wear the limbs for ten, twenty, or more years, without difficulty. We have the same experience of amputations at the knee-joint providing an end-bearing stump; the power to take pressure on the extremity encourages the wearer to engage in tasks which involve long periods of walking or standing. In all these cases we consider it essential that the stump shall fit snugly in the socket at the extremity, as in limbs which permit of a loose movement of the stump, either in the socket or on the end-bearing, there is danger from resultant friction. We consider that, even in the war cases, some of the trouble has arisen from imperfectly fitted limbs or from alteration in the stump after the artificial limb was applied, and that the number of these cases is now very small.

The coöperation and advice of the operating surgeon is of the highest value to the limb maker and it is by consultation together that the most perfect results are attained.

We are, Sir, yours faithfully,

W. R. GROSSMITH, LTD.,

12, Burleigh-street, W.C., April 26th, 1930.

A POSTAL WORKERS' BED.—Postal workers in all departments between Durham and Berwick-on-Tweed have collected £1000 for the endowment of a bed in the Royal Victoria Hospital, Newcastle-on-Tyne. The money has been provided in three years by voluntary deductions of pence from the wages of the contributors.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

DEBATE ON THE MINISTRY OF HEALTH VOTE.

Mr. Greenwood's Introductory Speech.

ON Tuesday, April 29th, the House of Commons went into Committee of Supply on a vote of £12,724,200 for the salaries and expenses of the Ministry of Health, Mr. R. YOUNG in the chair. The early part of a speech by Mr. ARTHUR GREENWOOD, Minister of Health, in introducing the vote, was reported in THE LANCET last week. Mr. GREENWOOD continued:

THE HEALTH SERVICES.

Maternal Mortality.

Unfortunately the problem of maternal mortality remained and during the last five years there had been a slight increase in the rate. That was serious. A special committee has been appointed by Mr. Neville Chamberlain when Minister of Health to consider this complex problem, and that committee had, among other things, been examining in detail individual maternal deaths, and out of that investigation he believed new light would come bearing on this subject. He hoped that within the next month or two the committee would issue an interim report. The Departmental Committee appointed to consider the working of the Midwives Act, with special reference to the training of midwives, reported not long ago, and their main recommendation was that a national maternal service should be instituted based on insurance principles under which necessary medical services should be provided as part of the medical benefit under the National Health Insurance Act; and the aim of the service would be to provide for more women proper attention during confinement with a view to reducing the rate of mortality. These matters were now under the consideration of the Government with a view to devising a scheme of maternity service which would have due regard on the one hand to maternity benefit under the Insurance Acts, and on the other to the services provided by local authorities under the Maternity and Child Welfare Act; for he was convinced that this complex problem would only be solved by utilising every means at their disposal.

Tubercle and After-care.

With regard to tuberculosis it was good to know that there was still a declining death-rate but more remained to be done. It was clear that a great deal had been done by sanatorium treatment and that more or less permanent cures had been effected and people after full treatment had been able to resume normal life and employment. But, unfortunately, in many cases a patient who had had sanatorium treatment could not well go back to the rough-and-tumble of ordinary life and ought to lead a sheltered life for a period. No doubt in most cases he had no financial resources, and unless cared for there might be a relapse and he might become a source of infection. In the past the tuberculosis campaign had had two objects in view; in the first place, the prevention of infection by the earliest possible discovery, and secondly, the provision of adequate treatment with a view to a cure of the disease. In the Public Health (Tuberculosis) Act, 1921, power was given to counties and county boroughs to make arrangements for the after-care of persons suffering from tuberculosis. Something had been done, but the fact that treatment seemed to be more urgent and that hitherto expenditure on after-care did not rank for grant as provision for treatment did, had no doubt deterred local authorities from making after-care provision.

The time had now arrived to press this question of after-care a little further. The financial provisions of the Local Government Act had obliterated any distinction between grant-earning and non-grant-earning services of local authorities. The fact also that public health authorities, county councils, and county boroughs were now public assistance authorities would lead them to see that it was cheaper in the long run to do all they could to restore people suffering from tuberculosis to wage-earning employment rather than allow them to fall on the funds of the public assistance committee. Something had been done by means of village settlements, a few of which existed in this country, the two most important being the settlement of Papworth, in Cambridgeshire, and Preston Hall, in Kent. The primary object of these establishments was to provide tuberculosis patients who had had treatment at a sanatorium with remunerative employment suitable to their physical condition and regarded as part of the cure, and as a means of bringing them back to a position of relative economic independence. These settlements had been more or less successful. There was a hospital section where cases are studied, where they were passed into the sanatorium when ripe for treatment, and where a certain amount of training could be undertaken under strict medical supervision. Then there was the training section where patients were sufficiently recovered for them to undertake definite instruction as part of their treatment, as well as with a view to fitting them for the industrial section of the settlement, and there was the industrial side of the settlement where a man had sufficiently recovered to work, say, six hours a day, and where he could not be driven but where he could employ himself for wages on work suited to his physical condition, where he could be watched and removed if his condition became worse. Those experiments were hopeful, and the experience of the existing settlements and the principles on which their successful working depended had been brought within the last few months to the notice of certain local authorities where, it seemed to him, conditions were favourable to the successful establishment and maintenance of similar establishments. He hoped that before very long the number of village settlements for tuberculous persons would be increased. Even if they were able to provide settlements for all those for whom settlements would be appropriate, they would still be left with a number of people who would require after-care, following on sanatorium or other treatment. He hoped that the local authorities, as the next move in the campaign against tuberculosis, would consider and experiment in methods of after-care for tuberculous persons.

THE POST-GRADUATE MEDICAL SCHOOL.

Less than three weeks ago he had announced in the House that the Government had agreed to make a contribution of up to £250,000 for buildings in connexion with the proposed post-graduate hospital and medical school, and although no money was being asked for under that head, in the present estimate, it seemed necessary to say something about it. The Government contribution was for the buildings, but increased grants would in future be given through the University of London when the school became a recognised school of that university. The publication of the scheme had been received with unanimous approval in both the lay and the medical press. He had since communicated with the London County Council and the University of London in order to get their coöperation in the scheme. That coöperation was necessary, and he hoped now, that in a very short time, they would have completed the next step in the process by the appointment of a fully representative committee representing all the various interests concerned, to consider the very complex problems of planning and administration and so on which must be solved before the scheme could be brought into operation. He believed that this was, perhaps, the most important single step which this country had taken in the interests of public health since the passage of the original Health Insurance Act, because, not only would this be a centre for post-graduate teaching for people from other parts of the Empire, but it would enable the general practitioners of this country, including the 16,000 panel doctors who served the State under the National Health Insurance Act, to have the chance, which they did not enjoy to-day, of keeping in touch with the rapid developments and changes which were taking place day by day in the art and the science of medicine. One looked forward to seeing after it had been at work a great improvement in the service which the medical profession would be able to provide for the people of this country.

Dr. VERNON DAVIES: Will the total expense of the post-graduate course be borne by the medical men themselves?

Mr. GREENWOOD: No; I hope that we shall have a certain amount of provision made to assist them. Proceeding, the right hon. gentleman referred to the question of psittacosis. In this country up to the present time they had known 115 cases of which 22 had been fatal. All of them were not associated with the importation of South American parrots; some of the cases were associated with African parrots and others even with love-birds. On account of the seriousness of the problem the Ministry in February issued a memorandum giving advice and suggestions to the public and arranging for coöperation between the medical officers of health and the medical officers of the Ministry in investigation work. That work had been going on and a comprehensive report on the whole question was now being prepared in the department. Meanwhile, events had made it imperative that action should be taken under the Public Health Acts to prohibit the importation of parrots for the time being. The date, May 20th, had been fixed in order to give sufficient time to warn people who might be on the point of importing parrots

Discussion on the Vote.

Sir KINGSLEY WOOD said that he did not think Mr. Greenwood had shown a sufficient grip of the present position in regard to the National Health Insurance Scheme. It was a matter of considerable anxiety to the approved societies and the many thousands of administrators engaged in the work.

The Position of National Health Insurance.

The position was, he said, so serious that if it was continued it would undoubtedly threaten the surpluses of the approved societies and the additional benefits, and particularly the hope of an expansion of benefits in the future. He (Sir Kingsley Wood) did not say that the finances of the scheme were not in a thoroughly strong position and that they had not large reserves—he thought the surpluses at the last valuation amounted to some £65,000,000—but it was a very surprising thing that they should have this revelation given in very impartial terms by the Government actuary of the very great rise in these claims. He did not think it was an exaggeration to say that during the term of the National Health Insurance Act no less than £100,000,000 had been spent on medical treatment and attendance during 17 years; and when they remembered that nearly £500,000 was being disbursed each week in cash benefit, that nearly £2,250,000 per annum was being expended on drugs, and that some 15,000 members of the medical profession gave 60,000,000 attendances every year to insured persons, it was a most surprising thing that they should have this statement of the Government actuary. There was another very serious side to the matter. It was particularly surprising when one recalled the great improvement in national health generally. There had been a very remarkable decrease in infantile mortality; he thought that in 1928 it was the lowest on record. The same thing could be said of the tuberculosis death-rate, and he thought it was Sir George Newman who said that 1928 was, perhaps, the healthiest year in the history of this country. Notwithstanding all that they had a record in regard to sickness and disablement claims which, in the words of the Insurance Comptroller, constituted "a challenge to all who are responsible for the welfare of the scheme." It was doubly a matter of anxiety because these increases had been continuing for so long. He noticed that in connexion with the percentage of claims to expectation in 1921, the sickness benefit claims for men were 76, and in 1927, the last available date, they had risen to 107. The figures in connexion with married women were more surprising still, because in 1921 they were 63, and by 1929 they had risen to 130. The figures for disablement benefit were more remarkable still. In 1921 for married women the figure was 66, and in 1927 it had risen to 171. From the summary of the report they found that comparing 1921 and 1927 the claims of men in respect of sickness benefit had risen by 41 per cent., the claims of unmarried women by 60 per cent., and the claims of married women by 106 per cent. The claims in respect of disablement benefit were even more disturbing. The claims of men had risen by 85 per cent., of unmarried women by 100 per cent., and of married women by 159 per cent. It was doubtless true that there was a changed standard of medical treatment and that there had been influenza epidemics. A comprehensive scheme of national health insurance such as this covered very many cases of poor physique and of persistent ill-health, and undoubtedly the prolonged spell of industrial depression had played its part in these figures, but no one could say that that was the end of the story, or that it by any means accounted for the position in which the national health insurance societies found themselves at the present time.

Lax Certification.

The Minister of Health would have to direct himself, he said, more closely to the position. After all he was mainly responsible for the medical services under the Act, for the approved societies were not concerned in it. They were given no right of interference with the medical profession. One was driven to the conclusion after reading these reports and the statement of the Government actuary that there was a good deal of lax certification. The panel practitioner was in a considerable difficulty; he had to decide when a man presented himself whether he was ill or not, and it was a considerable responsibility to refuse a certificate. It was a remarkable thing, however, and according to the Insurance Comptroller directly cases were referred from the panel practitioner to the regional medical officer, some 55 per cent. to 65 per cent. immediately declared off the fund. That undoubtedly called for some further explanation from the medical men who were engaged in this work. One could not say what proportion of these sickness claims were improper claims, but whatever the amount—and undoubtedly there was an amount—a considerable part was due to the alteration that had been made in the period in which an insured person was enabled to change his panel doctor. There was considerable danger in the relaxation. Medical men themselves have said, "How can you expect doctors to refuse certification—everyone being human—when they are faced with the position that if a certificate is refused the insured person can immediately go to another doctor?"

Dr. MORGAN: What body of doctors have ever said that?

Mr. PERRY: Surely the right hon. gentleman recalls that we often had numerous complaints from insured persons about the difficulty of changing doctors under the old system.

Sir KINGSLEY WOOD said they had gone to the other limit now. Undoubtedly there could be a considerable improvement without interfering with the proper rights of insured persons. It was a difficult position, but it would be a great deal worse but for the approved society system. He trembled to think what would be the position if they had one big State scheme.

The Reflex of Unemployment.

Sir DONALD MACLEAN said that it was extraordinarily easy to take prejudiced views about the increase in health insurance claims, and to miss the real issue which was raised by the remarkable increase in notified invalidity. On one thing at least they could congratulate themselves, and that was that there seemed to be no likelihood of the insolvency of the Health Insurance Fund. At the last valuation, about five years ago, there was a surplus of £65,000,000, and he had yet to learn that that huge sum had been substantially reduced. He quite agreed with the reasons put forward by the Minister for some of the increased number of claims. He did not deny that advantages were taken in many quarters of the facilities for getting sickness benefit; but following the year 1926, which started a period of great social difficulty for this country with an immense amount of unemployment, they had as an inevitable reflex of it a decline in the vitality of millions of the population. He thought that the attitude taken by the Minister was the correct one. What was required at present was an intensive internal examination into the whole problem by the sub-departments concerned.

Post-graduate Medical Study.

The announcement which was made the other day, he continued, in regard to post-graduate medical study, was one of the most important projects which had been undertaken for many years. The most brilliant medical men in this country had been forced to make a practice of attending what were practically post-graduate schools in Vienna, Berlin, Paris, and one or two other centres on the Continent. Some of them had even attended one or other of the wonderful schools in the United States of America. This country possessed the most capable, efficient and progressive body of medical men in the world. The research work which was accomplished so quietly in this country needed to be much more widely and fully utilised, not only for the benefit of our own practitioners, but for those who wished to come to this country from abroad. When crossing the Atlantic two years ago he made the acquaintance of an American surgeon of the highest standing. He told him he was coming over for six weeks, and was going to France to attend a post-graduate school. He would very much like to have the opportunity of seeing what was being done in this country, but there was no centre to which he could go. Knowing a great many medical men, he (Sir Donald Maclean) was able to put this surgeon on the right track. He went to the Continent, but stayed only a few days, and hastened back to London. He told him afterwards that the time he had spent away from London he regarded as wasted, because here he could obtain the most valuable information, and had seen very remarkable operations and some of the best research work in the world. He (Sir Donald Maclean) hoped that with the hospital arrangements which were being made at Hammersmith they would be able to establish a school the benefits of which would be felt not only here but throughout the Dominions. Quite recently a Committee appointed by the British Medical Association made a tour of Australia and New Zealand. He had received a letter from the immediate past president of the British Medical Association, in the course of which he said:

"On my visit to Canada and my recent tour to the branches of the British Medical Association in New Zealand and Australia—notably the Congress at Sydney as well as at Brisbane, Melbourne, Tasmania, Adelaide and Perth, and again in Ceylon, Bombay and Cairo—I was profoundly impressed by the constantly reiterated inquiries as to the prospects of the establishment in London of well-organised facilities for post-graduate study and research. I believe the scheme submitted will go far to meet this urgent demand from our medical colleagues throughout the Empire—at home as well as overseas—and that in its fuller developments it will constitute London, what she should long ago have become, a world medical centre for post-graduate work of the highest standard."

Causes of Increased Claims on Approved Societies.

Mr. RHYS DAVIES said that the first cause of the increase of health insurance claims was the destruction of a million of the fittest men of this country, and the maiming and bruising of millions in the great war. The disabled ex-Service men, unless they received a 100 per cent. pension from the Ministry of Pensions, came on the funds of the approved societies. While he agreed entirely in regard to the point which had been made about excessive certification by panel practitioners, there was one thing to be said in favour of medical men, and that was if a patient went to a doctor and complained that he was not well, he (Mr. Davies) knew of no medical man, however eminent, who could challenge that statement. It was alleged that when a young man came out of a university properly trained as a doctor, in order to build up a practice successfully and quickly he descended to issuing certificates in competition with other doctors. That was the allegation; whether it could be proved or not he could not tell.

Dr. MORGAN: It cannot be proved.

Dr. VERNON DAVIES: Of course not!

Mr. DAVIES said that anyhow he could give the medica Members of the House proof from his office that they had a medical certificate stating that a man was incapacitated from work when he was actually dead. How they were going to get over this difficulty he did not know. No committee in the world could do it. The Minister was right in making an investigation by way of a special medical examination. Rationalisation and speeding-up in industry had, in his view, been one of the greatest causes of the increase in the claims on approved societies' funds. He was not sure that societies had a proper system of sick visitation. A strange thing about this scheme was the more drugs people took the longer and oftener they were ill. The number of chemists' prescriptions in Manchester increased from 1,500,000 in 1924 to 2,250,000 in 1929 for approximately the same insured population, and still there were more sick than ever. There was no malingering except in respect of about 1 per cent. of the insured population. When they remembered the epidemics that had taken place almost every year, the lowering of the vitality of the people consequent on unemployment, especially in the mining districts, the effects of the war, and all those forces which were at work, it was not surprising the claims were heavy. But he trusted as a result of the debate they would be able to find out, not merely how to decrease the number of claims, but how to put the scheme once again on a sound actuarial basis.

Mortality-rate Down and Sickness-rate Up.

Mr. MELLER said that Mr. Rhys Davies had contended that as a result of the war there were a number of men maimed in body who would yield to any attack of sickness. If that were true they would expect to find the increase shown somehow in the ages between 34 and 50. But if they referred to the Government Actuary's report they would find that between 16 and 19 the percentage was 14 in 1921 and 24 in 1927. On the other hand, between 35 and 39 the percentage in 1921 was 13 and in 1927 21. They could therefore dismiss war disabilities as the probable cause of the increase. There had been epidemics of influenza and one would have expected in the period 1921 to 1927 some years in which sickness experience would have dropped very rapidly indeed. Instead of that they found the peak of one year becoming the low point of the following year. There was a gradual increase with apparently no reason for it. The Government Actuary showed, not that there had been a marked lengthening of the periods of incapacity, but there had been a broadening of the area of the people who came upon the sickness funds. The mortality-rate had dropped from 13·2 per 1000 in 1918 to 9·9 in 1928. How was it that medical treatment gave that remarkable decrease in the mortality-rate and a remarkable increase in the sickness-rate? Was this country raising a puny race, who in the old days were prepared to throw off comparatively slight ailments and carry on, but to-day were falling at the very suggestion that there was anything wrong? It was said that during the past year some 400,000 cases were referred to the medical referees. Of that number some 45 per cent. either declared off or failed to attend for examination; some 35 per cent. were found incapable of work; and the balance were found capable of work. It had been said by some medical men that the standard of examination of medical referees was different from the standard of examination of medical practitioners. There might be a difference of view between the practitioners and the referees. But it was a sad reflection that over a period of years the percentage of persons found capable of work by the referees had been certified—it might be for days or even weeks—by the panel doctor to be incapable of work. The inquiry which the Minister contemplated might throw some light as to whether there was a discrepancy between the methods adopted by the medical referees and those adopted by the panel doctors It was clear that every person who was entitled to benefit under this scheme should get benefit, and there ought not to be a differentiation in treatment by any of the medical practitioners. It was a striking thing that the recovery from long illness seemed to take place more rapidly when the value of the benefit was reduced. The inquiry which the Minister contemplated would at least show to the medical profession that this subject was being closely watched, and that doctors had to do something more than merely certify; they had to certify with proper care and precaution. If that debate did nothing more than bring doctors to a realisation of their duties it would have done something. In his view, whatever else the inquiry might find out, they would discover that they had to get back to the old method of transfer from one doctor to another.

THE MEDICAL VIEW.

Dr. MORRIS-JONES said that he understood that the Minister of Health could not touch on many important aspects of administration of the Department, but he was sorry that he did not mention one important matter, the question of vaccination. That matter affected medical and lay circles in this country, and would have to be faced. There were also international obligations associated with it. They saw this a very short time ago, when there was an epidemic in this country, and when a neighbour across the Channel raised difficulties with regard to people arriving there from this country. He hoped that the Minister of Health would face this matter. At present the administration of the law with regard to vaccination was almost farcical. If it was the opinion of the Government that vaccination should be compulsory, it ought to be made compulsory. At any rate, if the Government did not agree in that sense, steps ought to be taken to abolish compulsory vaccination.

Voluntary Services on Public Bodies.

He wished to say a few words in regard to the effect of the Local Government Act of 1929 on a large number of men and women who had been giving voluntary services on some public bodies. He was rather sorry that the late Minister of Health, who initiated and carried out that very great Act, had prevented a large number of public-spirited citizens from giving their services to local bodies on account of the fact that they would have to resign appointments which they had held for many years and which financially brought them very little benefit, but which under the Act they would have to give up or give up their voluntary services on a public body. In his own municipality—he spoke about medical men because he happened to know them better—it affected men and women who gave their services to local bodies. There was the case of a parish doctor who had been on the County Council since the beginning of that authority. Under the Act he had to take the choice of resigning an appointment which he had held for 30 or 40 years or resign his membership of the local authority. It was a pity that the right hon. gentleman did not preserve this great tradition of public service. Not only had these people to make the choice now as to whether they would give up their appointments or resign their membership of a public authority, but they knew that if they gave up their appointments and continued to serve in a voluntary capacity on the public authorities they would lose all superannuation payments, towards which they had contributed over a series of years, as well as the State contribution. It was an injustice that these men and women, who had given services for a great proportion of their lifetime, should now, because they might choose to continue their voluntary services to the State, be deprived of the superannuation towards which they had contributed for a large number of years. He hoped that the Government would be able to find a way of redressing this anomally.

Industrial Depression the Cause of Sickness.

A matter which had received public notice was that of the large number of claims under the National Health Insurance Act. The Minister of Health had referred to some of the causes of this increase, and Mr. Rhys Davies, who had had very considerable experience in these societies, also analysed some of the causes. He agreed with Mr. Rhys Davies that the main cause was the serious industrial depression since the war. There were amendments of the National Health Insurance Act whereby persons who were unemployed were still able to retain their rights to medical benefit. By going to the employment exchange and having their cards checked, they were able to continue to receive medical benefit. It was perfectly right that they should continue to receive medical benefit. Although the payment of that benefit might result in the depletion of the funds of the approved societies, it would not be fair at a time when the insured persons were the subjects

of enforced idleness, due to no fault of their own, that they should be deprived of medical benefit. From his experience as a medical man he found that enforced idleness, enforced unemployment, was bound to cause more sickness. The man who was working was much healthier than the man who was not working, and the same remark applied to a woman. A person who had nothing to do except to analyse his own slightest symptom was in such a frame of mind that a small symptom which would not receive any notice at a time when he was working was magnified when he had nothing to do but to think about it. This was a very potent cause of the increased number of claims for sickness benefit. There were, of course, other causes. There was the war, and the increased illness as a result of the war, even among those who did not participate as combatants. In the course of some years' experience under this Act, people had come to consult him or he had had to attend people who did not take any part in the war, but who, nevertheless, were suffering very seriously from having gone through that great catastrophe. Many insured persons had suffered from the bombing that took place in London. It was no exaggeration to say that there were hundreds of people in the County of London who, since the war, were directly or indirectly suffering as a result of the experiences which they went through at that time. There was another reason for the increased claims. He agreed with Mr. Rhys Davies when he said that 99 out of every 100 national health insured were honest, hard-working people, but that 1 per cent. were malingerers. He had had experience of persons who had come to him as a medical man under the Act, and had said: "We have been paying long enough." One person said to him: "We have been paying to Lloyd George for years, and it is time that we got something out of it."

The Difficulties of Certification.

He wished to say a few words in regard to the alleged laxity in giving medical certificates. The giving of medical certificates was a very difficult matter. Medical men were neither worse nor better than any other class of human creature, certainly no worse, and he did not suppose they were any better. They were confronted day by day with very great difficulties under this Act. One Member had mentioned in the dabate that a young medical man, newly qualified and anxious to build up a practice, would be rather keen to please his patient, and therefore he would possibly give a certificate when it was not really required. Quite possibly that might be the case, but he thought that such cases were very rare. It was an extraordinarily difficult thing to tell when a man was or was not capable of work. One of the most difficult things in the world was to prove that a man was not ill. There was a story told of a medical man who dealt rather cleverly with a man whom he knew was very definitely malingering. The man was making a very substantial claim on a railway company as a result of a railway accident. He stated that the pain in his back was so great that he could not stand upright. He walked into the doctor's consulting room bent on two sticks but the doctor had no doubt on the question of the man's capacity. As the man was bent in front of him, the doctor said "I can see that you are unable to stand upright on account of the pain in your back. Would you mind showing me how you used to stand before you met with your accident?" At once the man stood upright. There were occasions when one was able to find out whether or not a man was really ill, but generally it was very difficult. There had been cases known of responsible medical men, of great experience, pronouncing a man fit, and that man had died the same day. Medical science was not an exact science. There were very grave doubts in regard to many ailments. Certain possibilities of a very grave character did not show on the surface as obviously as they did in other cases.

Increasing Standard of Treatment.

On the whole, they saw from the report of the Ministry of Health and the statements made by the chief medical officer to the Ministry that the general standard of treatment under the Act had improved, and that great blessings had been conferred on the community. The claims on the service were constantly increasing. He was certain that the steps taken by the Minister of Health to inquire searchingly into the cause of the alleged and definitely large claims under the Act would result in some more certain causes being found than had been elicited so far. It was only fair to the insured population to point out that the same thing was happening in other countries which had adopted the health insurance system. In Germany and, he understood, in Ireland, the same thing applied as in England and Wales. He hoped the Minister of Health would be able thoroughly to overhaul and reorganise if possible the whole scope of the national health insurance service in this country. He hoped that the Parliamentary Secretary would say that the Government contemplated before long being able to bring before the House a scheme to enlarge the whole of the service of national health insurance, coördinating the numerous branches of it, and bringing within its scope women and children and dependents, thereby crowning an Act which had been a very beneficent Act for the people of this country.

(To be continued.)

THE SLUM CLEARANCE BILL.

The Housing (No. 2) Bill was considered by Standing Committee A of the House of Commons on Thursday, May 1st. Mr. SCURR was in the chair.

Insanitary Areas.

On Clause 1 (which gives a local authority power to declare an unhealthy area to be a clearance area,

Dr. VERNON DAVIES moved an amendment to provide that the local authority should act under the clause after consideration of an official representation from a medical officer of health. He said this was a slum clearance Bill and its basic object was the protection of the health of the people who lived in slums. A medical man was necessary in judging conditions relating to health, and there was a particular branch of medicine in which medical officers of health had to take a special diploma. Therefore the man to determine whether the condition of any property was likely to be injurious to health should be the medical officer of health. As the clause now stood, information might come from people who were absolutely incompetent to furnish information, or might be acting from improper motives.

Mr. GREENWOOD (Minister of Health) said he could not accept the amendment under which there could be no clearance scheme without the consent of the medical officer of health.

Lieut.-Colonel FREMANTLE: Oh, no!

Mr. GREENWOOD said that that was what it meant. There might well be cases in which a local authority would be doing right in going forward with a clearance scheme without having obtained what was virtually the consent of the medical officer of health.

Lieut.-Colonel FREMANTLE said he saw the point put forward by the Minister, but he did not think the position was quite what the right hon. gentleman had stated. Of course a local authority had other means of obtaining information in addition to receiving representations from their medical officer of health, but if the clause remained as it was they could proceed without any consultation with the medical officer of health, or any report from him. The medical officer was the official who was technically trained for this purpose, and if in certain cases he was inclined to be dilatory, the local authority could call upon him for a report and they had power to secure other information.

Sir TUDOR WALTERS said that a medical officer of health was not in all cases the best person to discover insanitary areas. He (Sir Tudor Walters) was not a doctor, but he would be a better judge of an insanitary area than the most distinguished medical an in the country, because it happened to be his business to know something about the laying out of buildings and their construction.

Administrative Effects.

Mr. NEVILLE CHAMBERLAIN said he looked at this matter chiefly from the point of view of administration, and he viewed this innovation with some considerable concern. It was quite true that under the Bill it was open to a medical officer of health to make an official representation to the local authority, but if they did not accept that representation, housing reform would be held up quite as much as by a default on the part of the medical officer of health. He thought it was desirable that the local authorities should have all the information from whatever source it might come, but the responsibility should rest on the medical officer of health, and not on anybody else. If the medical officer of health knew that without any representation from him the local authority could act on information received from anybody, that must necessarily weaken his responsibility. He asked the Minister to give further consideration to the matter.

Miss SUSAN LAWRENCE (Parliamentary Secretary to the Ministry of Health) said the normal way would be for the medical officer of health to make representations in the exercise of his statutory duties, but a local authority might well have recourse to other information and act upon it. The only point at issue was whether in the case where an authority could not convert its medical officer to its view it should be placed in the dilemma of having to dismiss him or to drop the scheme. The plan outlined in the clause had

worked perfectly satisfactorily under the Act of 1925, and she thought that the provision had been reenacted from an earlier Act.

After further debate,

The amendment was rejected by 33 votes to 12.

Mr. HARRIS moved an amendment to make it clear that a clearance area might include buildings other than houses. He said he moved the amendment on behalf of the London County Council.

Mr. GREENWOOD accepted the amendment, which was agreed to.

"Bad Arrangement."

Mr. WOMERSLEY moved an amendment to leave out from Subsection (1) the words "their bad arrangement," and to insert instead the words "want of light, air, ventilation, or proper conveniences."

Mr. GREENWOOD said it would be a most retrograde step to cut out from their operations huddled groups of buildings and streets so narrow that they were really injurious to health.

Mr. WOMERSLEY: What does "bad arrangement" really mean?

Sir WILLIAM JOWITT, Attorney General, said that these words had found their place in housing statutes for the last sixty years, and as far as he knew there had never been any difficulty arising out of their vagueness.

Lieut.-Colonel FREMANTLE said he had been discussing with the Society of Medical Officers of Health the provisions of this Bill. The amendments which the Society desired were very few, but there was one which they put forward dealing with the difficulty in defining the provision as to "unfit for human habitation." Though it was true, as Sir William Jowitt had said, that the term "bad arrangement" had been in the law for a number of years, the difficulty none the less remained. What had a medical officer got to decide as being "unfit for human habitation" other than sanitary defects, want of air, and so forth, which were included in the later definition clause? This was one of the reasons probably for the allegation that there had been slackness in certain areas. He did not think this amendment would get over the difficulty, but there was a real point of substance in trying to define the term "bad arrangement."

The amendment was negatived.

An Obscure Clause.

Mr. CHAMBERLAIN moved an amendment to confine a clearance area to houses only. He said that he had put this amendment down largely to clear up the real meaning of the clause, which he found extremely obscure.

Mr. GREENWOOD said that if this amendment were adopted it would prove utterly impracticable. It was obvious that once they were satisfied that an area was injurious to the health of the people all the buildings should go. The confusion appeared to arise because it was thought that the area must be a solid piece, but that was not so. It might be dotted with islands which were excluded from the clearance area because the buildings on those islands did not conform to the conditions laid down in the clause. If the buildings did not in any way contribute by their bad arrangement, and so on, to the injury of the health of the people, then clearly they did not form part of the clearance area.

The amendment was still under discussion when the Committee adjourned.

HOUSE OF COMMONS.

WEDNESDAY, APRIL 30TH.

Sickness and Disablement Benefits.

Sir FREDERICK HALL asked the Minister of Health the numbers of insured men per 100 who claimed sickness benefit in 1921 and 1927, respectively; the respective amounts of expenditure in the same two years for sickness and disablement benefits and the State treatment of disease; the cost per head of the population of England and Wales in 1921 and 1927, respectively, for national health insurance; the cost per head of that population for the same years for State medical treatment; whether the tendency was for expenditure on sickness benefit to decrease as expenditure on preventive and curative treatment increased; and if he would consider setting up a suitable body to inquire into the working of the Health Insurance Acts.—Miss LAWRENCE, Parliamentary Secretary to the Ministry of Health, replied: The information desired by the hon. Member is as follows: (1) According to a report recently furnished by the Government Actuary of the sickness and disablement benefit experience of a representative sample of the whole body of insured persons, the number of insured men per 100 who claimed sickness benefit in 1921 and 1927 was 14 and 23 respectively. (2) The amounts expended under the Health Insurance Acts in England and Wales in 1921 and 1927 in respect of (*a*) sickness benefit, were £7,176,800 and £11,818,000 respectively; (*b*) disablement benefit, were £2,689,600 and £6,368,000 respectively; (*c*) Medical benefit, were £9,394,800 and £8,772,500 respectively. In this connexion it is pointed out that the increase in the amounts expended on sickness and disablement benefits in 1927 as compared with the corresponding amounts expended in 1921 was to some extent due to the fact that in the later of those years there were larger increases in the benefit rates under the societies' schemes of additional benefits. (3) The cost per head of the population of England and Wales in 1921 and 1927 for National Health Insurance was 13*s.* 11*d.* and 18*s.* 8*d.*, respectively, and of medical benefit provided under the Health Insurance Acts 4*s.* 11½*d.* and 4*s.* 5½*d.* respectively. As regards the last two parts of the question I would refer to the reply given on the 10th inst. The factors which have contributed to the increases above noted are numerous and complex, and without further and fuller consideration my right hon. friend does not think it possible to make any general statement as to the relation between those facts and the increased provision of curative and preventive treatment to which the hon. Member refers.

Importation of Unsound Meat.

Mr. THORNE asked the Minister of Health if he was aware that 541 carcasses of mutton from the Patea district of New Zealand were recently examined at a Wapping cold store for caseous lymphadenitis and 27 carcasses condemned; that 40 bags of legs of mutton were recently examined at the Port of London refrigerator, Charterhouse-street, and out of 400 legs 31 were found to be badly affected with the disease and condemned; and that the 27 sheep from Patea, New Zealand, had each attached to the leg a certificate of a veterinary inspector of the New Zealand Government to the effect that they had been examined and found sound; and if he would approach the High Commissioner of New Zealand and issue instructions that in future a thorough examination must be made of all legs and shoulders imported in bags at all centres where such bags are landed.—Miss LAWRENCE replied: My right hon. friend has made inquiries and is informed that the facts are substantially as stated in the question. He is bringing the matter to the notice of the Governments of the exporting countries. It is recognised by the local authorities concerned that several parts of carcasses require special attention, and on the information before him my right hon. friend does not think it is necessary to take the course suggested in the last part of the question.

THURSDAY, MAY 1ST.

Food Tickets as Unemployment Relief.

Sir GEORGE PENNY asked the Minister of Labour whether, instead of paying the full amount of unemployment benefit in cash, she would consider the desirability of issuing food tickets for a proportion of the amount where the recipient had a family dependent upon him.—Miss BONDFIELD replied: This suggestion has been considered several times in the past. In my view, it would not be desirable to adopt it.

Coroners' Salaries.

Mr. TINKER asked the Home Secretary the salaries paid to the coroners for St. Helens and Leigh; and what other parts of the county they had charge of in addition to the above.—Mr. CLYNES replied: St. Helens is in the West Derby Coroner's District which includes the Petty Sessional Divisions of Kirkdale, Ormskirk, St. Helens, Southport, and Warrington, parts of the Petty Sessional Divisions of Leigh, Prescot, and Wigan, and the whole of the County Boroughs of Bootle, St. Helens, Southport, and Warrington. The salary, I understand, is £1145. Leigh is in the Bury District, which includes the Petty Sessional Division of Bolton and parts of the Petty Sessional Divisions of Bury, Leigh, and Wigan, and the whole of the Borough of Leigh and of the county borough of Bury. I understand that the salary is £625.

Milk for School-children.

Mr. HURD asked the President of the Board of Education what educational authorities were participating in the campaign to increase the consumption of milk by school-children; and what extension of the campaign was in contemplation.—Sir CHARLES TREVELYAN replied: I understand from the National Milk Publicity Council that their Milk Service scheme in the schools is in operation in 82 areas, with the general approval and encouragement of the local education authorities concerned. A number of other authorities are providing milk meals under their arrangements for the

provision of meals. I am anxious to see an increase in the consumption of milk in the schools, and with this end in view I am keeping in close touch with the National Milk Publicity Council.

"Drink More Milk" Campaign.

Mr. HURD asked the Minister of Agriculture what steps were being taken to renew and extend the drink more milk campaign; and what evidences were available of the increased consumption of liquid milk as a result of such propaganda.—Dr. ADDISON (Parliamentary Secretary to the Ministry of Agriculture) replied: There is no special milk advertising campaign in progress in this country at the present time, but the National Milk Publicity Council is continuing its work in the formation of milk clubs in the elementary and secondary schools of this country, which it is estimated has increased the consumption of milk by about 4,000,000 gallons a year.

Disposal of London Refuse.

Lieut.-Colonel FREMANTLE asked the Minister of Health how soon the report of the Departmental Committee on the Disposal of London Refuse was to be published.—Mr. GREENWOOD replied: I am informed that the Report is likely to be signed in the course of the present month.

Smoke Abatement.

Lieut.-Colonel FREMANTLE asked the Minister of Health how many local authorities had made by-laws under Section 5 of the Public Health (Smoke Abatement)Act, 1926; whether model by-laws under this section had been issued from the Ministry of Health for the guidance of local authorities; and, if not, what was the reason.—Mr. GREENWOOD replied: No local authority has made by-laws or forwarded draft by-laws under this section. Model by-laws have not yet been issued, by reason of technical difficulties.

Psittacosis.

Mr. HACKING asked the Minister of Health how many cases of parrot disease had been reported to him during each of the past two months.—Mr. GREENWOOD replied: My department has received information of 24 cases of illness which commenced during March, and two during April, in which the patients had been associated with sick parrots. I am advised, however, that in the present state of knowledge of psittacosis, it is not possible to say definitely how many of these persons were in fact suffering from that disease.

MONDAY, MAY 5TH.

Medical Qualifications in India.

Mr. FREEMAN asked the Secretary of State for India whether the Government of India had received any proposals for the constitution of an inter-university medical board, consisting of representatives of the Government and of the university, pending the establishment of an All-India General Medical Council; and, if so, whether they proposed to take any steps in the matter.—Mr. WEDGWOOD BENN replied: This proposal was made by a Conference of Indian Universities last October. It was referred to the General Medical Council, whose executive Committee adopted on Feb. 24th a resolution stating that it was unable to accept the proposal as furnishing a satisfactory method of supplying the Council with authoritative information on medical qualifications and standards in India, and with the necessary guarantees of sufficiency.

Mr. FREEMAN also asked whether it was proposed to revive the competitive examinations for admission to the Indian Medical Service; and, if so, whether he would consider the desirability of ordering these examinations to be held in India only.—Mr. WEDGWOOD BENN replied: I am sending my hon. friend a copy of the report of a debate on this subject in the Indian Legislative Assembly on Jan. 28th last, in which the present position is explained. It will be seen that the Government of India propose to review the situation and send me their considered views, which I am expecting shortly.

Development Fund Grant.

Mr. RAMSBOTHAM asked the Secretary to the Treasury the exact use of the grant of £500,000 made by his department to the development fund.—Mr. PETHICK-LAWRENCE (Financial Secretary to the Treasury) replied: The grant of £500,000 to the Development Fund will be issued in instalments as and when required. The advances (grants and loans) already recommended by the Development Commissioners and approved by the Treasury, includes £65,000 (in addition to £35,000 sanctioned previously) for the rebuilding of the Royal Veterinary College, and £4250 for the extension of the laboratory at the Cambridge Department of Animal Pathology.

TUESDAY, MAY 7TH.

Nurses' Conditions at Larbert Asylum.

Miss LEE asked the Secretary of State for Scotland what steps he intended to take to improve the wages and working conditions of nurses in Larbert Asylum.—Mr. ADAMSON replied: The General Board of Control are at present making inquiries into the conditions of service generally in Scottish asylums and the Larbert Asylum will be included within the scope of the inquiries.

Health of the Mercantile Marine.

Sir BASIL PETO asked the President of the Board of Trade the names of those serving on the committee set up to consider and advise on the health of the mercantile marine; and whether their report on the hygiene of crew spaces on board ship might be expected shortly.—Mr. W. GRAHAM replied: The membership of the committee is as follows: Representing the Board of Trade—Mr. E. J. Foley (Chairman), Mr. G. E. Baker, Mr. A. S. Hoskin, and Mr. C. J. Ovey (Clerical Secretary); Representing the Ministry of Health—Sir George S. Buchanan, Dr. P. G. Stock, Mr. M. Heseltine, Mr. R. H. Crooke, and Dr. M. T. Morgan. (Medical Secretary). I cannot yet say when the committee will be in a position to report on the question of the improvement of the hygiene of crew spaces.

Surplus Funds of Approved Societies.

Mr. HAYDAY asked the Minister of Health (1) the total surplus funds standing to the credit of all approved societies under the Health Insurance Acts, at the nearest convenient date; and (2) the total amount set aside by approved societies for the last insurance year for additional benefits; and the nature of such additional benefits and the amounts, respectively, allocated.—Mr. GREENWOOD replied: The total of the surplus funds of approved societies and branches under the Health Insurance Acts is ascertained by quinquennial valuations. The results of the last completed valuations are summarised in the report of the Government Actuary dated Nov. 25th, 1926 (Cmd. 2785). The hon. Member will see from that report that the total surpluses amounted to £42,413,319, from which amounts totalling £26,619,161 were certified for distribution in additional benefits in the ensuing quinquennium. Out of the above distributable surplus, £13,345,000, or about onehalf, was applied by the societies and branches concerned in providing increases of the statutory cash benefits, and the remainder was utilised for the provision of various treatment benefits. The most important of these benefits and the annual sums made available for them during the period of the schemes (including State grant) were as follows: Dental benefit, £2,900,000; ophthalmic benefit, £470,000; hospitals, £324,000; convalescent home treatment, £233,000; and medical and surgical appliances, £142,000. As regards the total reserve funds of approved societies, I would refer to the reply given on March 6th last.

National Health Insurance.

Mr. HAYDAY asked the Minister of Health the number of insured persons removed from health insurance on attaining the age of 65 years, and how many of these were transferred from sickness benefit to old age contributory pension for the year ending January, 1930.—Mr. GREENWOOD replied: The number of insured persons who, up to Dec. 31st, 1929, had ceased to be entitled to sickness and disablement benefits under the National Health Insurance Acts by reason of the reduction of the age limit from 70 to 65, is estimated to have been about 650,000. These persons have not been "removed from National Health Insurance," since they continue to be entitled to medical benefit, and to any additional benefits in the nature of treatment after attaining the age of 65. I regret that the information asked for in the second part of the question is not available.

First-Aid in Coal Mines.

Mr. THOMAS WILLIAMS asked the Secretary for Mines whether the new regulations regarding first-aid at coal mines were compulsory, and, if so, if he had received any complaints concerning collieries who had failed to carry them out.—Mr. BEN TURNER replied: The answer to the first part of the question is in the affirmative, and to the second part in the negative. These regulations, which only came into operation a month ago, involve big changes, amounting at some collieries to a complete reorganisation of first-aid work. In some instances it has not yet been possible for this reorganisation to be carried out in the full detail required by the regulations, but the matter is receiving the special attention of H.M. inspectors, who will see that there is no unnecessary delay.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Lt. J. V. Williams to be Surg.-Lt. Comdr.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. to be Col.: Bt.-Col. (temp. Col.) J. S. Bostock from R.A.M.C.

Lt.-Col. D. S. Skelton to be temp. Col.

Maj. and temp. Lt.-Col. A. S. Littlejohns to be Lt.-Col., vice Lt.-Col. and Bt.-Col. (temp. Col.) J. S. Bostock.

Maj. C. R. M. Morris to be temp. Lt.-Col.

Maj. C. S. P. Hamilton retires, receiving a gratuity.

Capt. E. H. W. Elkington to be Maj.

Capts. to be Majs.: J. D'A. Champney and V. J. Perez.

ARMY DENTAL CORPS.

Lts., temp. Dental Surgs., Gen. List, to be Lts. (on prob.): W. C. Cook and S. G. Watson.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Maj. P. R. Bolus having attained the age limit, retires and retains his rank, with permission to wear the prescribed uniform.

ROYAL AIR FORCE.

Flying Officer J. L. Groom is promoted to the rank of Flight Lt.

INDIAN MEDICAL SERVICE.

Maj. R. de S. B. Herrick to be Lt.-Col.

Medical News.

UNIVERSITY OF OXFORD.—On May 1st the following degrees were conferred:—

D.M.—R. A. Walsh.

B.M.—R. G. Macbeth and M. G. Pearson.

UNIVERSITY OF CAMBRIDGE.—On May 3rd the following degrees were conferred:—

M.B., and B.Chir.—John Foster, T. D. W. Fryer, and C. J. M. Dawkins.

B.Chir.—*T. O. Garland.

* By proxy.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the final examination from March 31st to April 24th the following candidates were approved in the subjects indicated, but are not eligible for the diplomas of the Colleges:—

Medicine.—N. B. Bapat, Bombay and Birmingham; S. W. T. Bentall, London; A. C. Bhardwaj, Lahore and Guy's; I. Billig, St. Thomas's; J. D. Bright-Richards, Liverpool; G. F. Carey, St. Thomas's; P. Chandra, Punjab and St. George's; L. Charney and D. N. Chatterji, London; A. H. Clegg, Leeds; Jane A. Davies, Cardiff and Royal Free; V. S. H. Davies, Liverpool; C. A. V. De Candole, St. George's; C. H. Devin, St. Bart.'s; D. Divine, Guy's; D. Durbach, St. Bart.'s; D. G. Evans, Cardiff and Univ. Coll.; E. D. FitzPatrick, Birmingham; P. I. Franks, St. Bart.'s; L. P. Friedman, Univ. Coll.; W. G. Glassco, McGill and St. Mary's; L. H. Griffiths, Bristol; Florence R. Hart, King's Coll.; Carrie I. Hearn, Pennsylvania and Royal Free; H. R. Hovsha, King's Coll.; J. C. de V. Hutchinson, Cape and Guy's; E. B. Jackson, Univ. Coll.; E. J. Javeri, London; C. R. Kenchington, Birmingham; F. S. Krusin, Guy's; S. R. Ledger, King's Coll.; R. F. Lomax, Guy's; S. H. Lubner, London; Marjorie N. Lunn, Royal Free; F. G. Maitland, St. Thomas's; A. F. Merchant, Bombay; D. K. Mulvany, King's Coll.; P. B. Nair, Bombay and Royal Free; Ethelwyn M. Newham, Royal Free; P. W. Parkes, Birmingham; M. A. Parthasarathy, Bombay and Guy's; R. V. C. Richards, Cardiff and Bristol; L. Rose, St. George's; A. L. Rowson, Manchester and London; K. C. Sarkar, King's Coll.; Ida B. Saxby, Bristol; Ester C. Seifert, Westminster; M. Shorvon, King's Coll.; A. Shufleder and M. I. Silverton, Leeds; C. H. Sims, Westminster; D. J. R. Steen, St. Thomas's; H. B. Swift, St. Mary's; C. J. L. Thurgar, Univ. Coll.; O. T. Wade, Leeds; E. C. Watson, St. Mary's; Celia Weinstein, Royal Free; and Margaret E. Williams, Bristol.

Surgery.—F. P. Adams, St. Bart.'s; G. L. Alcock, St. Thomas's; N. W. Alexander, Cambridge and St. Thomas's; W. T. Andrews, St. Thomas's; R. E. Angel, St. Bart.'s; Lily Arratoon, Royal Free; J. Aytoun, Middlesex; F. G. Badger, Cardiff and London; Inez E. Banner, Royal Free; J. H. Beilby, Cambridge and St. Thomas's; Ilma B. S. Bingemann, St. Mary's; A. T. Blair, St. Bart.'s; B. F. M. Bond, Westminster; O. H. Bostock, St. George's; F. K. Boston and W. R. Burrows, St. Bart.'s; G. W. Causey and J. W. Cheetham, Liverpool; H. T. Chilton, Birmingham; C. N. Chitnis, Bombay and St. George's; R. T. V. Clarke, St. Bart.'s; E. C. Coaker, St. Mary's; D. H. Collins,, Liverpool; W. D. Coltart, St. Bart.'s; A. C. Dawes Birmingham; J. A. Doherty, Univ. Coll.; W. S. Dyson Manchester; A. Elliott, Birmingham; D. G. Evans Univ. Coll.; A. A. G. Flemming, Bristol; E. V. P. Fox St. Bart.'s; P. P. Fox, Liverpool; C. E. D. H. Goodhart, St. Bart.'s; Lorna M. A. Goulden Bach, Westminster; Olive N. Grant, Royal Free; F. R. T. Hancock, St. Bart.'s; H. E. Harding, London; J. O. Harrison, St. Bart.'s; G. Hale, St. Thomas's; A. R. C. Higham, St. George's; Constance M. Hoare, King's Coll.; Beatrice M. Joly, Royal Free; I. G. Jones, Univ. Coll.; M. S. Khan, Cambridge and Middlesex; F. R. Kitchin, Liverpool; G. C. Knight, St. Bart.'s; F. S. Krusin, Guy's; J. C. Leedham-Green, Middlesex; Henrietta M. Macleod and Moyra I. Macnaughton-Jones, Royal Free; J. W. Meanley, Leeds; C. G. Muller, Madras and St. Mary's; K. I. Nicholls, Bristol; T. C. Outred, Guy's; D. L. Pugh, Univ. Coll.; V. H. Riddell, St. George's; N. H. L. Ridley, St. Thomas's; D. M. Roberts, Cardiff and London; M. W. Robinson, Manchester; A. W. M. Rooke, Univ. Coll.; M. H. Salaman, Cambridge and London; F. M. Sandford, St. Thomas's; Margaret W. Schreiber and Dorothy A. Sharpe, Royal Free; H. J. Shorvon, St. Thomas's; C. J. C. Siggers, Guy's; C. H. Sims, Cardiff and Westminster; M. Singh, Birmingham; W. L. Sleight, Bristol; A. A. Staunton, St. Bart.'s; J. G. Stewart, Westminster; H. M. Strover, Bristol; C. E. Taylor, King's Coll.; R. S. Taylor, Middlesex; J. W. P. Thompson and A. W. Vaisey, St. Thomas's; M. G. Vatsalya, Bombay and Royal Free; J. G. Warren, London; A. B. Williamson, Durham; Maureen D. Willmott-Evans, Royal Free; and F. W. Willway, King's Coll.

Midwifery.—R. Ahmad and S. G. Allen, London; G. H. H. Ames, Univ. Coll.; A. T. Andreasen and R. E. Angel, St. Bart.'s; J. Aytoun, Middlesex; E. H. S. Bebb, London; W. R. Bion, Univ. Coll.; Marjorie E. Birch, Liverpool; J. F. E. Bloss, St. Thomas's; Kathleen M. Bodkin, Birmingham; K. Bown, Univ. Coll.; Dora E. Brockbank, Royal Free; K. C. Buck, St. Mary's; A. H. Bulleid, London; W. R. Burrows, St. Bart.'s; Beatrice L. Campion, Royal Free; G. W. Causey and W. N. Chalmers, Liverpool; J. Chamberlain, Guy's; L. P. B. Chamberlain, St. Bart.'s; T. Chandrasekharan, Madras and Manchester; J. W. Cheetham, Liverpool; F. A. Clift, Toronto and London; Adelina A. Collins, King's Coll.; D. H. Collins, Liverpool; R. V. S. Cooper, Birmingham; A. G. Cowie, St. Mary's; L. C. Crane, Manchester; I. Culank, Middlesex; H. E. B. Curjel, St. Thomas's; M. K. Cusack, St. Bart.'s; V. S. H. Davies, Liverpool; A. C. Dawes, Birmingham; P. T. L. Day, Guy's; G. A. Desai, London; S. B. Dimson, Univ. Coll.; R. H. Dobbs, Cambridge and London; G. W. Duncan, Univ. Coll.; Joanna M. Egerton, King's Coll.; A. Elliott, Birmingham; S. H. Ferguson, Sheffield; B. Fine, London; E. D. FitzPatrick, Birmingham; J. S. B. Forde, Manchester; P. P. Fox, Liverpool; K. H. Gaskell, King's Coll.; Rachel N. Gillespie, Royal Free; S. E. Godwin, St. Bart.'s; C. E. D. H. Goodhart, Cambridge and St. Bart.'s; Olive N. Grant, Royal Free; J. B. Great Rex, St. Bart.'s; Rachel Gubbay, Royal Free; J. H. Hall, Cambridge and St. Thomas's; W. H. Hargreaves, St. Bart.'s; Joan E. Harwood, Charing Cross; M. A. Hatt, St. Thomas's; F. Hilmy, Durham; W. Hogg, St. Bart.'s; G. R. Hopper, Liverpool; Doris I. Howell, Charing Cross and Cardiff; A. Ingham, Birmingham; E. Jones, St. Thomas's; C. R. Kenchington, Birmingham; F. R. Kitchin, Liverpool; B. W. Knight, St. Bart.'s; Madeline E. E. Knowlson, Westminster; N. I. Kronenberg, Guy's; J. S. Lane, Cambridge and Guy's; B. Lawn, St. Thomas's; J. C. Leedham-Green, Middlesex; H. M. List, St. Bart.'s; H. O. Lyne, Guy's; P. H. Maal, Liverpool; J. MacDonald, Glasgow; J. E. S. MacDonald, London; W. F. McGladdery, St. Bart.'s; F. G. Maitland, St. Mary's; Dorothy Makepeace, King's Coll.; S. F. Marshall, St. Bart.'s; H. Marsten, Charing Cross; E. K. Menon, Madras and Birmingham; Barbara A. Merlin, Royal Free; Caroline E. Nicholson, Charing Cross; T. F. B. Noble, London; Angela M. S. A. Ofenheim and Lily M. O'Hanlon, King's Coll.; G. Y. Oon, Charing Cross; M. A. Parthasarathy, Bombay and Guy's; F. L. L. Patrick, St. Bart.'s; C. Pratelli, Middlesex; L. B. Reeves ,King's Coll.; Anna L. M. Ringdahl, Univ. Coll.; D. R. R. Roberts, St. Mary's; M. A. Robertson, Cambridge and London; J. T. Rowe, St. Bart.'s; Agnes A. S. Russell, Glasgow; S. Ryman, Zurich; M. H. Salaman, Cambridge and London; A. G. Sanders, St. Thomas's; K. C. Sarkar, King's Coll.; M. N. Sardana, Punjab; Margaret W. Schreiber, Royal Free; J. B. Schofield, Guy's; Ester C. Seifert, Westminster; A. Shafi, Charing Cross; Dorothy A. Sharpe, Royal Free; I. Sherman, St. Bart.'s; H. Shoukry, Birmingham; C. J. C. Siggers, Guy's; H. Simmons, St. Bart.'s; C. K. Simpson, Guy's; D. O. C. Simpson, London; K. C. S. Skene, Univ. Coll.; S. K. Squires, St. Mary's; T. Standring, King's Coll.; A. A. Staunton, St. Bart.'s; N. V. Storr, St. Thomas's; R. B. Sutcliffe, Guy's; H. B. Swift, St. Mary's; G. Tattersall, Manchester; C. E. Taylor, King's Coll.; D. Trimble, Birmingham; C. K. Vartan, St. Bart.'s; N. A. Vernon, St. Thomas's; R. S. Wale, King's Coll.; S. I. Weinstein, London; J. C. S. Wells, Univ. Coll.; A. M. Weston, Guy's; W. E. Whaite, Manchester; R. C. W. Whitling, Oxford and London; S. O. Widmann, St. Thomas's; K. L. Wig, Charing Cross; R. N. H. Williams, Cambridge and St. Bart.'s; H. W. Williamson, St. Bart.'s; W. H. Willis, Western Reserve Univ.; F. W. Willway, King's Coll.; D. Wilson, St. Mary's; Edna M. Wilson,

Charing Cross; W. E. Wimberger, Birmingham; W. G. Wright, King's Coll.; and Erika R. Wulfahrt, Royal Free.

Pathology.—A. T. Andreasen, St. Bart.'s; W. Aukin, Univ. Coll.; C. O. Barnes, St. Bart.'s; C. R. G. Barrington, Univ. Coll.; G. Barwell, K. Biden-Steele, and W. V. D. Bolt, Guy's; G. D. S. Briggs, St. Bart.'s; L. V. O. Brown, Guy's; K. C. Buck and H. Canwarden, St. Mary's; A. R. Clarke, Guy's; G. M. Conder, Middlesex; A. C. Crooke, London; M. K. Cusack, St. Bart.'s; F. M. Day, St. Mary's; D. M. Dean, St. Bart.'s; L. E. A. Dearberg, Guy's; C. H. Devin, St. Bart.'s; J. W. H. Foy, Liverpool; L. P. Friedman, Univ. Coll.; P. W. Godfrey, Leeds; E. R. Greathead, London; J. B. Great Rex, St. Bart.'s; K. Harris, Guy's; Eileen E. Harvey, Royal Free; D. W. James, Guy's; B. W. Knight and J. S. Knox, St. Bart.'s; S. Lefcovitch and G. A. M. Lintott, Guy's; G. D. McLean, St. Thomas's; R. W. McNabb, Guy's; J. B. Marshall, St. Mary's; S. F. Marshall, St. Bart.'s; J. W. Oliver, Guy's; G. H. Pearce, Univ. Coll.; S. Rajapaksa, King's Coll.; A. W. M. Rooke, Univ. Coll.; M. Shorvon, King's Coll.; H. Silverberg, Middlesex; C. H. Sims, Westminster; K. C. S. Skene, Univ. Coll.; R. N. C. Smith and K. S. Southam, Guy's; S. K. Squires, St. Mary's; J. T. C. Taylor, St. Bart.'s; C. J. L. Thurgar, Univ. Coll.; R. S. Wale, King's Coll.; J. C. S. Wells, Univ. Coll.; Mary J. Westall, Royal Free; R. Wilkinson, Birmingham; Anne E. Williams-James, Bristol; and D. Wilson, St. Mary's.

EUGENICS EDUCATION SOCIETY.—Mr. Henry Twitchen, of Portland-place, London, and formerly of Western Australia, after other bequests has left his residual estate, estimated at about £100,000, to the Eugenics Education Society, of Upper Bedford-place, London.

CHADWICK PUBLIC LECTURES.—At the Royal Sanitary Institute, 90, Buckingham Palace-road, London, S.W., at 8 P.M., on Thursday, May 15th, Mr. Edward Willis will lecture on The Collection and Disposal of Refuse.—Sir William Collins will preside at a lecture entitled Cabbages and Kings, to be given by Mr. A. W. Hill, F.R.S., director of Kew Gardens, in the Chelsea Physic Garden, Swan Walk, Chelsea, at 5 P.M., on Thursday, May 29th.

GLASGOW UNIVERSITY CLUB, LONDON.—The annual summer dinner of this club will be held at the Trocadero Restaurant, Piccadilly, on Friday, May 30th, at 7·30 P.M., with Mr. Robert S. Rait, LL.D., Principal and Vice-Chancellor, presiding. Any Glasgow University men who, though not members of the club, desire to attend, are asked to communicate with the hon. secretaries at 62, Harley House, N.W.1.

SEROLOGICAL DIAGNOSIS OF CANCER.—As we have already announced, the Italian Anti-Cancer League (Lega Italiana per la lotta contro il cancro, via Triboniano, Piazza Cavour, Rome) offers a prize of 15,000 lire for a paper written from a critical and experimental standpoint, on the value of serological methods in the diagnosis of malignant tumours. The paper must be submitted in proper form before June 30th.

MEDICAL PRAYER UNION.—The annual medical missionary breakfast will be held at 8 A.M. on Wednesday, May 21st, at the Refectory, University College, Gower-street, London, W.C. An address will be given by Mr. John Kirk, F.R.C.S., of University College, London, late of Kwangtung, China. Those intending to be present should inform the hon. secretary, Dr. Tom Jays, Livingstone College, Leyton, E.10.

ROYAL INSTITUTION.—At the annual meeting of the members of this institution on May 1st the following officers were elected for the ensuing year. President: The Duke of Northumberland. Treasurer: Sir Robert Robertson. Secretary: Major C. E. S. Phillips. Among the managers elected were Mr. Ernest Clarke, F.R.C.S., Sir James Crichton-Browne, M.D., and Mr. V. Warren Low, F.R.C.S.; while among the visitors were Prof. G. E. Gask, F.R.C.S., Mr. David Heron, F.R.C.S., Mr. G. W. C. Kaye, D.Sc., and Dr. H. R. D. Spitta.

CRITICISM OF PANEL PRACTITIONERS.—At the fifty-first annual conference of the Friendly Societies' Medical Alliance, held at Buxton on Easter Monday, a discussion arose on the following paragraph in the report of the council:—

"We believe and confidently assert that our system of whole-time medical service is the most efficient and satisfactory that can be provided for workers and their dependents. It is certainly better adapted to the requirements of National Health Insurance and the Friendly Societies generally than the existing part-time service afforded by panel doctors who are mainly occupied and interested in private practice and fee-paying patients, to whom preferential treatment is usually afforded."

One of the delegates said that they were looking forward to a national medical institution where they would be able to feel assured that the health of the people was cared for by doctors who would come under State control. The paragraph quoted was eventually deleted from the report.

ESSEX COUNTY MENTAL HOSPITAL.—A new nurses' home, adjacent to this hospital, which has been built at a cost of £22,000, was opened last week. It accommodates 67 nurses and has a large recreation room.

MANCHESTER ROYAL INFIRMARY.—This hospital reports a large progressive increase in casualties. Last year there were 30,648, a daily average of 84; in 1920 it was only 50. In-patients (11,356) stayed an average of 17·67 days and cost £3 3*s.* 11*d.* per week each.—*Old Residents' Club*: The triennial dinner of this club will be held in Manchester on Saturday, Oct. 25th, 1930. Particulars will be circulated to members in due course.

TAVISTOCK-SQUARE CLINIC.—Nearly 300 people attended the annual meeting and luncheon of this clinic on May 5th, and Dr. H. B. Brackenbury, who presided, was able to report a growing interest in its work. A recognition of the psychotherapeutic needs of many insured persons would, he felt, do much to lessen the claims for sickness and disablement benefit now being received under the Insurance Acts. Dr. W. J. Adie said that while there were many excellent old-established hospitals for the treatment of organic nervous disease, facilities were at present inadequate for the treatment of functional disease. Again and again he had been forced to tell hospital patients that he was unable to provide them with the treatment they needed, and that he did not know where they would obtain it. The situation was now a little better because some of them could be sent to the Tavistock Clinic. He was able to recommend the institution with great confidence because he knew that psychotherapeutic treatment was not given indiscriminately, and that great care was exercised in assessing the importance of physical and psychical factors. If more was known about the upbringing of children and how to help young people through adolescence, much mental suffering would be prevented in later life. The Tavistock Clinic was already doing good work in this direction, and with the support it deserved it would do more. Miss Ishbel Macdonald emphasised the need for preventive work and was anxious for the establishment of more homes where patients could be sent during treatment at the clinic, so as to remove them temporarily from their usual environment. (A hostel has recently been opened, but on a very small scale.) Dr. H. Crichton-Miller, the honorary director, spoke of the growth of the clinic—a growth which was unfortunately not associated with growth of the building. The need for extension was very great, for the cases under treatment had increased from 700 two years ago to 914 this year. The number of attendances last year was 7472.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, May 13th.—5 P.M., THERAPEUTICS AND PHARMACOLOGY. Annual General Meeting. Election of Officers and Council. Informal Discussion: The Treatment of Disseminated Sclerosis. Opener: Sir James Purves-Stewart. 8.30 P.M., PSYCHIATRY. Annual General Meeting. Election of Officers and Council. Dr. Hubert J. Norman: Psychiatry in Relation to History and Biography.

WEDNESDAY.—5 P.M., SURGERY: SUB-SECTION OF PROCTOLOGY. (Cases and specimens at 4.30 P.M.) Annual General Meeting. Election of Officers and Council. Discussion: Radium in Cancer of the Rectum and Colon. To be opened by Sir Charles Gordon-Watson, who will show a film illustrating the treatment; followed by Dr. Lacassagne, Mr. Stanford Cade, Mr. Lockhart-Mummery, Mr. W. S. Perrin, and others. Mr. Lionel E. C. Norbury: Two Specimens of Rectal Carcinoma after Treatment with Radium. Other cases and specimens will be shown.

THURSDAY.—5 P.M., DERMATOLOGY. (Cases at 4 P.M.) Annual General Meeting. Election of Officers and Council. Cases: Dr. F. A. E. Silcock (introduced by Dr. G. B. Dowling). Papillaris Capillitii. Case for Diagnosis. Dr. R. T. Brain (for Dr. O'Donovan): Poikilodermia of Cavatte with Unusual Distribution. Ectodermal Defect, Tylosis and Dystrophy of Nails. Dr. G. B. Dowling: Case of Acne Agminata, Treated with a Gold Compound.

FRIDAY.—8 P.M., OBSTETRICS AND GYNÆCOLOGY. Annual General Meeting. Election of Officers and Council. Dr. Francis J. Hector: A Case of Endometrioma. Dr. G. W. Theobald: The Toxæmias of Pregnancy; a New Conception. Mr. A. J. Wrigley: Puerperal Infection by the Pathogenic Anaerobic Bacteria. 7 P.M., ELECTRO-THERAPEUTICS (at the Langham Hotel, Portland-place, W.). Annual General Meeting and Dinner. Election of Officers and Council.

SOCIETY OF RADIOGRAPHERS, 32, Welbeck-street, W.

WEDNESDAY, May 14th.—7 P.M., Mr. C. H. Holbeach, A.M.I.E.E.: Planning of an X Ray Department.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, May 12th.—8 P.M., Annual General Meeting. 8.45 P.M., Dr. Herbert Spencer will give a short account of 54 autograph Lettsom letters presented to the Society.—9 P.M., Sir Arthur Keith: Modern Medicine and Evolution. Annual Oration, which will be followed by a Conversazione.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck-street, W.
THURSDAY, May 15th.—8.30 P.M., Dr. P. J. Kerley: The Pathology of Early Pulmonary Tuberculosis as Revealed by X Rays.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.
THURSDAY, May 15th.—8.15 P.M., preceded by a Demonstration at 7.45 P.M. Dr. H. M. Shelley: Pellagra in Nyasaland.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.
FRIDAY, May 16th.—4 P.M. (annual provincial meeting at Harrogate): Discussion on Rheumatism in its Public Health Aspects.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, May 12th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Wards.
TUESDAY.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Mr. Hamblen Thomas: Throat, Nose, and Ear Dept. 2.30 P.M., Sir Henry Simson: Gynæcological Operations.
WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2.30 P.M., Mr. Donald Armour: Surgical Wards. Dr. Scott Pinchin: Medical Out-patients.
THURSDAY.—11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Department. 2 P.M., Mr. MacDonald: Genito-Urinary Department.
FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Department. 2 P.M., Mr. Sinclair: Operations.
SATURDAY.—9 A.M., Mr. Vlasto: Throat, Nose, and Ear Operations. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Children's Department.
Daily. 10 A.M. to 5 P.M., Medical, Surgical, and Special Out-patients, Operations, Ward Visits, Anæsthetic Courses.

UNIVERSITY COLLEGE, Gower-street, W.C.
TUESDAY, May 13th.—5.30, P.M., Prof. W. E. Blatz: Modern Theories in Habit Training in the Pre-school Child.
WEDNESDAY and THURSDAY.—5.30 P.M., Prof. F. J. Cole: The Early History of Generation and Comparative Anatomy. (Third and Fourth of six free lectures.)

LONDON SCHOOL OF MEDICINE FOR WOMEN, Hunter-street, W.C.
MONDAY, May 12th, and following TUESDAY and THURSDAY.—5.30 P.M., Dr. A. Lacassagne: Treatment of Uterine Cancer by Radiations. (Free lectures.)

ST. MARY'S HOSPITAL INSTITUTE OF PATHOLOGY, W.
THURSDAY, May 15th.—5 P.M., Dr. Leonard Hill: The Physiology of Diving.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.
TUESDAY, May 13th, and following THURSDAY and FRIDAY—5.30 P.M., Prof. A. J. Kluyver: Activities of Micro-organisms.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, May 12th, to SATURDAY, May 17th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. M.R.C.P. Special Course. Lectures every Tues. and Frid. at 8.30 P.M.—Tues., Dr. J. W. McNee: Recent Views on Diseases of the Liver and Biliary Tract. Frid., Dr. J. W. McNee: The Structure and Functions of the Spleen in Relation to its Diseases.—BOLINGBROKE HOSPITAL, Wandsworth Common, S.W. Mond., 10 A.M., Dr. Stanley Wyard: Demonstration in O.P. Department. No fee.—LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W. Thurs., 2 P.M., Mr. Herbert Paterson: Demonstrations in Wards and Operations. No fee.—CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C. Intensive course (clinical) in diseases of the throat, nose, and ear, lasting until May 24th.—MAUSDLEY HOSPITAL, Denmark Hill, S.E. Course in Psychological Medicine. Clinical Practice of Hospital. Special Lectures and Demonstrations.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Afternoon and Evening Course of Instruction in O.P. Department. Lectures on certain afternoons during the week.—CITY OF LONDON HOSPITAL FOR DISEASES OF THE HEART AND LUNGS, Victoria Park, E. All day course, lasting two weeks. Further particulars from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, May 12th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose, and Throat Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat, and Ear Clinics. Operations.
FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M., Medical, Surgical, and Children's Diseases Clinics. Operations.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.
TUESDAY, May 13th.—5 P.M., Mr. W. McKim McCullagh: The Treatment of Post-partum Hæmorrhage.

LONDON SCHOOL OF DERMATOLOGY, SUMMER COURSE, St. John's Hospital, Leicester-square, W.C.
MONDAY, May 12th.—5 P.M., Dr. H. MacCormac: Treatment of Syphilis.
TUESDAY.—5 P.M., Dr. A. M. H. Gray: The Sarcoids and Lupus Pernio.
THURSDAY.—5 P.M., Dr. I. Muende: Pathological Demonstration.
FRIDAY.—5 P.M., Dr. Knowsley Sibley: Alopecia.

GREAT NORTHERN HOSPITALS POST-GRADUATE LECTURES.
WEDNESDAY, May 14th.—3.15 P.M. (at the Royal Chest Hospital, City-road), Dr. Barty King: Demonstration of Cases in the Wards.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
TUESDAY, May 13th.—4.15 P.M., Dr. C. H. Melland: Gastric Ulcer.
FRIDAY.—4.15 P.M., Dr. D. E. Core: Demonstration of Medical Cases.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, May 14th.—4.15 P.M. (at the Royal Infirmary), Dr. J. C. Middleton: Medical Cases.

Vacancies.

For further information refer to the advertisement columns.

Bath, Royal United Hospital. H.P. £120.
Bedford County Hospital.—H.S. At rate of £175.
Birmingham General Hospital.—H.S. £70.
Birmingham, Queen's Hospital.—Res. Anæsthetist and Cas. H.S. Each at rate of £70
Birmingham, St. Chad's Hospital.—Res. M.O. £100.
Birmingham, Selly Oak Hospital.—Cas. O. At rate of £200.
Bolton Infirmary and Dispensary.—Res. Surg. O. £250.
Brighton, New Sussex Hospital for Women and Children.—H.S. and H.P. Each £50.
Brighton, Royal Alexandra Hospital for Sick Children.—H.P. £100.
Bristol Royal Hospital for Sick Children and Women.—Out-patient Phys. Also In-patient Surg. and Out-patient Surg.
Bristol Royal Infirmary.—Hon. Reg. for Ophthalmic Dept.
Bury St. Edmunds, West Suffolk General Hospital.—Jun. Res. M.O. £120.
Cambridge, Addenbrooke's Hospital.—Res. Anæsthetist. Also H.P. At rate of £180 and £130 respectively.
Cambridge University.—Fearnsides Scholarship for Clinical Research.
Cardiff Royal Infirmary.—H.S. At rate of £50. Aural H.S. and Cas. Surg. O. Each at rate of £75.
Charlton Relief District.—District M.O. £200.
Children's Hospital, College-crescent, Hampstead.—Res. M.O. At rate of £100.
Colchester, Royal Eastern Counties Institution for Mental Defectives.—Jun. Asst. M.O. £350.
Derbyshire Education Committee.—Asst. School M.O. £600.
Derbyshire Royal Infirmary.—Hon. Asst. S. Also Hon. Asst. S. to Ear, Throat, and Nose Dept.
Doncaster Royal Infirmary.—2nd H.S., 3rd H.S. Each £150. Also two Hon. Anæsthetists. £50.
Dorset County Hospital.—H.S. At rate of £120.
Dublin, Richmond Hospital.—Hon. Asst. Surg.
Durham County Hospital.—Sen. H.S. At rate of £160.
East London Hospital for Children and Dispensary for Women, Shadwell, E.—H.S. Also H.P. Each at rate of £125.
Elizabeth Garrett Anderson Hospital, Euston-road.—H.P., Obstet. Asst., Three H.S.'s. Each at rate of £50.
Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.
Glasgow Eye Infirmary.—Res. H.S. £150.
Gloucestershire Royal Infirmary and Eye Institution.—2nd H.S. At rate of £100.
Gt. Barrow, nr Chester, East Lancs., Tuberculosis Colony, Barrowmore Hall.—Asst. M.O. £250.
Great Yarmouth General Hospital.—H.S. £125.
Halifax Royal Infirmary.—3rd H.S. At rate of £100.
Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—Cas. M.O. and Cas. Surg. O. Each at rate of £100.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W Temporary Anæsthetist. At rate of £50.
Hove, Lady Chichester Hospital.—Jun. H.P. At rate of £50.
Hull Royal Infirmary.—H.S. At rate of £150.
Hyde, Borough of.—Asst. M.O.H. (Part-time). £300.
Inverness, Northern Infirmary.—H.P. £100.
Leeds Public Dispensary.—Jun. Res. M.O. £150.
Leicester Royal Infirmary.—3rd Res. M.O. Anæsthetist. At rate of £250.
Liverpool and District Hospital for Dis. of Heart.—H.P. At rate of £52.
London Female Lock Hospital, 283, Harrow-rd.—H.S. At rate of £150.
London Hospital, E.—Cardiographic Dept. Paterson Research Scholar, £400.
London Jewish Hospital, Stepney Green, E.—Res. M.O. Also Cas. O. Each at rate of £150. Jun. Res. M.O. At rate of £100.
London University, Chair of Physiology.—£1000.
Maidstone, Kent County Mental Hospital.—Asst. M.O. £300.
Manchester, Ancoats Hospital.—H.S. At rate of £100.

Manchester City.—M.O. for Maternity and Child Welfare Centres. £600.
Manchester Royal Infirmary.—H.P. and H.S. Each £200.
Manor House Hospital, Golders Green, N.W.—Jun. H.S. £200.
Mildmay Mission Hospital, Austin-street Bethnal Green, E.—Sen. Res. M.O. Also Jun. Res. M.O. At rate of £140 and £100 respectively.
Miller General Hospital, Greenwich-road, S.E.—Pathologist. £600. Out-patient Officer. At rate of £150. H.P. and H.S. Each at rate of £125.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Res. Anæsthetist. At rate of £100. Also Hon. Asst. Gyn.
Nottingham General Hospital.—2nd Cas O. At rate of £150.
Plymouth, South Devon and East Cornwall Hospital.—H.P. At rate of £120.
Portsmouth Royal Hospital.—H.P., 3rd H.S. Each at rate of £130. Also Cas. O. At rate of £100.
Reigate Borough of.—M.O. for Maternity and Child Welfare Centre. £150.
Rochester, St. Bartholomew's Hospital.—Res. Surg. O. At rate of £225.
Royal College of Surgeons of England.—Election of Professors and Lecturers. Also to Court of Examiners.
St. Bartholomew's Hospital, E.C.—Asst. Dental Surgeon. Also Physician.
Salford Royal Hospital.—H.P. Also Cas. H.S. Each at rate of £125.
Sheffield Royal Hospital.—Res. Ophth. H.S. Also Res. Anæsthetist. Each at rate of £80.
Sheffield Royal Infirmary.—Asst. Cas. O. At rate of £80.
South Eastern Hospital for Children, Sydenham, S.E.—Asst. and Res. M.O.'s. At rate of £100 and £75 respectively.
Southampton, Royal South Hants and Southampton Hospital.—Asst. H.S. At rate of £140.
Southern Rhodesia Medical Service.—Three Asst. and Relieving Government M.O.'s. £500.
Staffordshire Mental Hospital, Cheddleton, Leek.—Temp. Asst. M.O. One guinea per day.
Stoke-on-Trent, Longton Hospital.—H.S. £120.
Swansea General and Eye Hospital.—H.S., Cas. O., and H.S. Each at rate of £150. Also H.S. to Ear, Nose, Throat and Ophth. Dept. At rate of £200.
Walsall General Hospital.—Sen. H.S. At rate of £200.
Warwick, Warwickshire King Edward VII. Memorial Sanatorium, Hertford Hill.—Med. Supt. £800.
West London Hospital, Hammersmith, W.—Hon. Surg.
Weston-super-Mare General Hospital.—Res. H.S. £130.
Weymouth and District General Hospital.—H.S. £180.
Whipps Cross Hospital, Whipps Cross-road, Leytonstone, E.—Anæsthetist. £300.
Willesden General Hospital, N.W.—H.P. £100.
Wolverhampton Royal Hospital.—Cas. O. and Res. Anæsthetist. At rate of £125.
Woolwich and District War Memorial Hospital, Shooters Hill, S.E.—H.S. At rate of £125.
Worksop, Victoria Hospital.—H.S. At rate of £170.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Week St. Mary (Cornwall); Exmouth (Devon); and Southend (Essex).

Births, Marriages, and Deaths.

BIRTHS.

ARTHUR.—On May 2nd, at Noy's End, Brockham, Betchworth, Surrey, the wife of Dr. J. H. Arthur, of a son.
COCHRANE.—On May 1st, the wife of Dr. Robert G. Cochrane, Orpington, of a son.
GARRETT.—On April 27th, at Leicester, the wife of Dr. E. B. Garrett, of a daughter.
JONES.—On May 2nd, to Drs. Catherine and Ernest Jones, York-terrace, N.W.—a daughter.
JORY.—On May 2nd, the wife of Philip Jory, D.S.O., F.R.C.S., of a son.
MOORE.—On April 29th, at The Brow, Essa-road, Saltash, Cornwall, the wife of Surgeon-Commander N. S. Moore, R.N., of a son.
ROE.—On April 27th, the wife of Patrick Roe, M.B. Lond., of a son.

MARRIAGES.

BARFORD—HANDLEY.—On April 23rd, at St. Francis's Church, Crawley, Leslie Joseph Barford, M.A., M.D., to Isabella Helen, younger daughter of Mr. and Mrs. Robert B. Handley, of Mayfields, Lowfield Heath, Crawley.
WHYTE—WARD-PAGE.—On April 26th, at St. Michael's Church, Woburn Sands, Bucks, Alexandra Fraser Whyte, M.B., Ch.B., to Mona Ward-Page, only daughter of Mr. and Mrs. H. Ward-Page, Silver Birch, Apsley Heath, Beds.

DEATHS.

COUPLAND.—On April 29th, at Wootton Ridge, Boars Hill, Oxford, Sidney Coupland, M.D., F.R.C.P., aged 80 years.
CUTLER.—On May 3rd, at Onslow-gardens, S.W. after a short illness, Horace Arthur Cutler, M.D., B.Ch., aged 54.
GRIER.—On April 29th, Lieut.-Colonel Henry Grier, A.M., R.A.M.C. (retired), of Denton House, Guildford, aged 75.
HEARSEY.—On April 30th, suddenly, at Kareli Estate, Bareilly, India, Lieut.-Colonel Herbert Hyde Young Hearsey, O.B.E., M.B., C.M., late P.M.O., of Nyasaland.
HEATH.—On April 30th, 1930, at 34, Devonshire-place, W.1, after a long illness, Agnes Fridzwede, wife of Charles J. Heath, F.R.C.S.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

Notes, Comments, and Abstracts.

SHOULD MEDICINE BE A MENDICANT?

A REVIEW OF OUR HOSPITAL SERVICE.

Harveian Lecture delivered at the Harveian Society of London on March 13th

BY ERNEST W. HEY GROVES, F.R.C.S. ENG.,
PROFESSOR OF SURGERY IN THE UNIVERSITY OF BRISTOL.

(*Continued from p. 998.*)

Three Types of Institution.

IN reviewing the present position of the hospital service of this country we distinguish three different types of institutions: the public health service with the municipal hospitals; the large voluntary hospitals, many of which have medical schools attached to them; and thirdly the smaller town, country or cottage hospitals, which serve the needs of a local area. For the sake of completeness one ought to add a fourth class—namely, the private hospitals and nursing homes—but for the moment I would leave them out of the consideration. All these groups of hospitals are suffering from such serious drawbacks and disabilities that we are justified in saying that the British hospital system is in need of reform and reorganisation.

I.—*The Municipal Hospitals.*

These are really a very modern product. They have been called into existence by the fact that the voluntary hospitals are incapable of dealing with the numbers of cases requiring treatment. Beginning as workhouse infirmaries they have rapidly grown into large general hospitals admitting acute cases. In the city districts the municipal hospitals, generally speaking, are good modern buildings, comparing very favourably in these respects with the voluntary hospitals of the same place. In the country districts the public hospitals are still inadequate both in size and structure, but this deficiency is likely to be remedied in the near future, because of the provisions of the recent Local Government Act. But taking the best type of city municipal hospital there is a glaring defect which quite spoils the institution, and makes it only a second or third-rate affair. This is the inadequacy of the staff. All such hospitals have a whole-time medical staff responsible for the administrative work. Some in addition have whole-time medical and surgical officers responsible for treatment, whilst others have a part-time visiting medical staff doing this part of the work. But in all cases the total number of the staff is below the standard known to be necessary for a first-class hospital, and far below the standard of the voluntary hospitals. If the municipal hospital of the future is to be a first-class hospital, then it must have its staff raised both in numbers and status. If it is to be definitely relegated to the position of a second-class hospital, then some process of selection of cases must be adopted by which such a large proportion of chronic or convalescent cases are sent to it as will justify its being staffed by a few resident administrative officers, with the addition of a few consultants.

The present position of the municipal hospitals may then be said to be one of rapid and vigorous growth supported by public funds, independent of philanthropy, certainly destined in point of number of beds to become the largest element of our hospital service; but at present it only provides a second-rate type of hospital, because of the inadequacy of the staff.

II.—*The Large Voluntary Hospitals.*

The second group, including those with medical schools, represents the main element in our hospital service. We are justly entitled to regard these hospitals with pride and affection, because they have been the cradle and nursery of all that is best in the tradition of English medicine. In fact so much has the vigour and growth of medical science been identified with the voluntary hospitals in this country that it is impossible to name a single great man in our profession who has done anything for the advancement of the science and art of medicine, who has not spent a large part of his working life in one of the voluntary hospitals. His discovery of truth has been made in that hospital, and his gift to humanity has been fashioned and brought to perfection in its precincts. And yet, in spite of this glorious tradition and the pride we have in our great teaching hospitals, the ruthless march of events has now come to jeopardise their very existence.

The voluntary hospital, the principal arena in which the fight between science and disease is taking place, the very laboratory of clinical research has to struggle for existence, its growth is stunted and its activities are crippled just because a proper adjustment has not yet been made between financial demand and supply. But the thing which is fundamentally wrong in the position of the voluntary hospitals is that maintenance by mendicancy and the independence of public control are retained as almost sacred principles—as ideals to be aimed at, instead of merely temporary expedients and conditions suitable to provide resting houses for sick poor, but utterly unfitted to provide the essential machinery of scientific medicine or the treatment of the bulk of the sick of a wealthy nation. But be the cause what it may, the fact remains that the voluntary hospitals, the backbone of our hospital system, are in a bad way. Growth and development are stunted, because income is ever being passed by expenditure, and the waiting-list of those seeking admission is steadily growing, or else such applicants are drifting off to municipal hospitals or country institutions.

III.—*The Third Hospital Group.*

This is perhaps the most difficult to criticise or discuss, because it contains units of such different sizes and such varied qualities. I think it is fairer to group the large voluntary hospitals, even if they have no teaching schools, but are staffed by consultants who do not engage in general practice with the second group. The category of a hospital is determined much more by the standing of its visiting staff than by the character of the building or the sources and amount of its income.

I would then define the smaller town hospitals and county hospitals as those staffed for the most part by men in general practice. Now I find it extraordinarily difficult to say what I believe to be true about these hospitals without overstating or distorting the truth. Many of these hospitals are well built and well situated, and their staff represents the best of well-qualified general practitioners, and yet there is something gravely wrong, and the work done is below the standard of what hospital work ought to be.

I know that these hospitals are responsible for turning out a great deal of bad surgical work, and I suspect that a similar statement might be truthfully made about their work in medical and special departments. This is really no reflection upon the character or the professional attainments of the staff. They are being asked to carry out an impossible task, that of being general practitioners and also specialists at the same time. To the mind of the public, and in the opinion of many who ought to know better, a doctor is a doctor and a hospital is a hospital. An isolated small town may in this respect be compared to a ship going to sea. Perhaps the little community consists of 500 to 1000 people, and it carries a ship's doctor and one or two nurses. It has a good pharmacy and may even have an operating theatre. But it is clearly understood by all concerned that this provision for medical attendance and treatment is only for meeting the simple ailments of every-day life, or for dealing with some exceptional emergency. If any grave illness or accident occurs the treatment of which permits delay, such treatment is postponed until the patient can be transferred to a suitable institution ashore. The fact that a medical man, fully qualified in medicine, surgery, and midwifery is on board does not lead anyone to expect that specialist treatment will be afforded to all or sundry whilst on the voyage.

A country district or a small town is provided by the munificence of a private donor or by collective subscriptions with a hospital of from 10 to 50 beds. The country doctor or the town doctor naturally welcome this as affording a place where cases of severe illness can be nursed and attended. But it must be obvious that neither scientific elaboration of diagnosis and treatment nor the provision of experienced specialists can be commanded by these institutions. But if scientific elaboration and experienced specialists are necessary to carry out the treatment of disease in the city, why are these not necessary in the country? It can hardly be suggested that country patients generally suffer from less obscure ailments or less severe accidents than are experienced by dwellers in the city. These small hospitals, which have multiplied greatly in recent years and especially since the war, are, of course, the products of the voluntary system, and embody many of its worst features. The foundation, endowment, and maintenance are all private gifts or the product of irresponsible mendicancy.

There is no authority which can either stop or control the setting up of a cottage hospital, neither when once it has been established is there any power, other than public opinion, by which its conduct can be regulated. Public-houses and music-halls cannot be established without authority or conducted without supervision, but hospitals, by our English tradition, would appear to require neither safeguard. This third group, the smaller voluntary hospitals, shows growth and development in size and numbers, but I would venture to submit that the growth is unhealthy, and requires the most careful consideration by the medical profession, who should be prepared to submit some plan by which the smaller hospitals might be graded and brought into organic union with the rest of our hospital service.

Fundamental Test of a Perfect System.

I have already indicated that the fundamental test of the voluntary system is not its capacity to provide so much money for so many beds. The question is rather—can it provide the best type of hospital service for the bulk of the community? My thesis is that it cannot, that the best type of hospital service and the voluntary principle are incompatible under modern conditions, and that so long as the maintenance of the voluntary system is made the first and greatest object of our hospital policy, then the attainment of a perfect hospital service must be abandoned or relegated to a second place in our programme. In setting out these terms of my thesis I have been in doubt whether to use the term voluntary or mendicant. I have chosen to adhere to the words voluntary system, because it is that in familiar use, and because I do not want to weary you by a constant reiteration of the unpleasant word "mendicant." But I would make it clear that as at present the voluntary system is essentially one which depends for its support on begging appeals, it is in its character as a mendicant system that I am criticising it throughout.

The voluntary system fails to provide a perfect hospital system for the following reasons. The hospital is founded and managed by laymen, whose main qualification for the work is their philanthropy and not their expert knowledge. So long as they pay their way and do not contravene the regulations of the Health Ministry there is no authority which can guide or control the work of a voluntary hospital. It is an independent unit in the social service, which does not coöperate with other institutions doing similar work. In every city voluntary hospitals have been founded independently of one another, and even in opposition to each other. Originally there may have even been a political or sectarian reason for this opposition, and, though this may have ceased or been forgotten, the rival institutions continue to compete with one another for public support. Expenditure is very carefully controlled in regard to the feeding and nursing of patients, but it is extravagant and wasteful in the multiplication of overhead charges, scientific equipment, and, worst of all, of specialists, involved by having two or three rival institutions instead of one. But quite apart from the financial extravagance involved in having several small hospitals, there is the inefficiency of multiplying special departments. Three hospitals of 200 beds existing in the same city each have an eye department and perhaps six beds allotted to each—and to each of these is attached an ophthalmic surgeon. The department at each hospital is not large enough for the ophthalmic surgeon to have an assistant, and the situation is, perhaps, saved from absurdity by the foundation of a special eye hospital in addition to the general hospitals, where there is a reasonable chance of an ophthalmic clinic justifying the existence and guaranteeing the efficiency of three ophthalmic surgeons in one town.

Research and the advancement of medical knowledge, which ought to be the very first reasons for a hospital's existence, have to be subordinated to the prime object of getting enough money to keep going as many beds as possible. For the moment I am not referring to laboratory work, but to the actual care and cure of patients. For research and advancement in this, careful records, statistics, and a "follow-up system" are absolutely necessary—but these are generally left for haphazard note-taking, or to individual efforts to trace case-histories. Compare for a moment the expense and personnel of the registrar's department of a hospital with that of a secretary, and you will admit my point.

If the work of a hospital is regarded as a business enterprise, the first object of which is to cure or relieve the greatest number of patients in the quickest and most satisfactory manner, then surely every business man would say that it is of the utmost importance to examine most closely every method used, and to note the immediate and the late results. An analysis of deaths with their causes, reports of different methods of treatment and their results would be matters of routine inquiry. Every new operation would be carefully followed up to see if it was justified by recoveries or condemned by disasters. Such routine research ought to be an essential part of the every-day work of the hospital, and will require a considerable staff of trained clerks, working under proper supervision.

(To be concluded.)

THE GUARDIANSHIP SOCIETY.

THE Guardianship Society, which arranges for the care and supervision of the mentally and physically defective, held its annual meeting at Brighton on April 12th. A further increase of work in all the departments of the society was recorded in the annual report, "a growth which year by year is a proof of its necessity, and no limit can be placed to its future possibilities." The report stated that unsolicited applications during the 12 months totalled 482, as against 461 in the previous year, the national interest of the society being emphasised by the fact that no fewer than 383 were from districts outside Sussex. A large number of patients were still on the waiting list. During the year the society had 943 persons under care, in addition to which 70 were visited in their own homes, exclusive of after-care patients. The mental after-care department formed to keep in contact with patients discharged from the mental hospitals was becoming increasingly important, 89 new cases being added during the year, bringing the total on the register to 314. The clinic for nervous disorders had completed four years of most valuable work. Since its inception 371 patients had been treated, and this early treatment, the report claimed, had undoubtedly been instrumental in saving many patients from being certified. The society has two cottage farms in Sussex, and the work of training defective lads at these occupational centres, the report said, was proving highly satisfactory. Dr. S. E. Gill, medical inspector to the Board of Control, said his colleagues and he were struck with the excellent work the society was doing; he looked forward to the time when every local authority would have a day training centre comparable to the institutions for the blind and the deaf and dumb, where defectives could go and receive their training while living at home. Other speakers included Dr. J. R. Kaye, formerly senior medical officer for the West Riding of Yorkshire, who gave a short address on the Multiplication of the Unfit.

THE USE OF RATTHANAT.

THE usual methods of rat destruction are not without disadvantages of one sort or another; drowning, ferretting, and shooting require elaborate preparation, and the use of poisons is attended with danger to domestic animals. The Bacteriological Institute of the Chamber of Agriculture of Berlin and Brandenburg has prepared a poison derived, it is stated, from "sea-onions," a popular name for *Scilla maritima* or squill. The poison is made up in cubes of bait attractive to rats, and has been given the proprietary name of Ratthanat. Even small quantities of the preparation when ingested by rats appear to cause death, with hæmorrhage into the intestine and enlargement of the spleen and kidneys. The dying rat seeks water and consequently often dies away from the premises on which the poison was taken. Domestic animals, it is claimed, are unaffected by the poison. Reports on the use of Ratthanat by the Institute for Hygiene, the Health Department of the City of Berlin, and the Prussian Institute of Hygiene are favourable; in each case test rats were used and received the preparation with other food; all the animals under experiment died in one, two, or three days, after a period of distress which usually terminated in coma and occasionally in convulsions. It is claimed that rats will attack the cubes even in the presence of other food and that one cube contains sufficient bait to kill six to eight rats. The poison usually has the effect of sterilising the intestine, thus helping to prevent offensive odours should the rat die in its hole. The bait can be obtained from Rat Exterminators, Ltd., Simpson House, Sheppy-place, Minories, London, E.C. 3.

MENTAL HEALTH.

THE National Council for Mental Hygiene and the Tavistock Clinic held a conference last year which is now reported in a useful book.[1] Lord Brentford, who presided at the inaugural meeting, emphasised the urgency of the problem of mental health by reminding his audience that in 1928 some 50,000 persons in this country came under observation for mental breakdown, and that 4871 committed suicide. Sir Maurice Craig showed the fallacy of the widely accepted idea that mental disturbance is a bolt from the blue; on the contrary, "it is commonly a slow and progressive failure in which the early stages are very frequently overlooked or misunderstood." Perhaps the best definition of mental ill-health was provided by Dr. H. P. Newsholme, who said that "broadly speaking, it implies failure of the individual to use his mental machinery with a degree of efficiency sufficient to maintain easy running for normal demands with a reserve of power for emergencies." Dr. A. Helen Boyle made a refreshing contribution in her plea that the most healthily minded child is the one with the greatest power of adaptability and judgment, so that a certain amount of irregularity in routine is a positive advantage. Dr. E. A. Hamilton-Pearson backed up this opinion by his counsel that, under right discipline, children should be allowed to buy their own experience, and by his warning that atrophy of mind, no less than of muscle, leads to disablement. The conference was divided into a number of sections, such varying aspects of mental health being discussed as sex education, juvenile courts, the personal equation in industry, mental hygiene in social and public work, the child and the parent, delinquency, and the problem child at home and in school. The general standard of the papers was at an unusually high level, and this unpretentious volume is a useful contribution by experts to a branch of medical study constantly growing in importance.

[1] Report of The Proceedings of the Conference on Mental Health held in the Central Hall, Westminster, London, Oct. 30th to Nov. 2nd, 1929. Edited by Dr. J. R. Lord. London: Adlard and Son, Ltd. 1930. Pp. 95. 2*s*.

CURRENT ENGLISH.

THE little Oxford Dictionary of Current English[1] measures 5¼ by 3½ by ¾ inch, and contains within this compass all the words which an educated person need know at the present time and far more than he can ever use. It would be difficult for anyone unacquainted with lexicography to estimate the skill and labour which have been put into this book. The final result may be compared with the neat and shining crystals of insulin obtained by evaporation, precipitation, and concentration of a mass of raw material by means of processes which it has taken a century to devise. The task of packing into 600 pages all that would go into them was entrusted to Mr. Ostler, who served for 44 years on the composing and reading staff of the Clarendon Press and whose encyclopædic knowledge has been at the service of two generations of compositors and authors. The dictionary is a guide to pronunciation as well as to choice of words; it warns the unwary that opus has a long o in the singular and a short one in the plural, and that midwifery is discreetly pronounced midifri. Current medical terms such as hormone, adrenalin, and vitamin are all there (the latter is given a short i); proprietary terms are marked with the letter p. The list of abbreviations will help the reader with most of the useful contractions, but we regret the omission of G.M.C. and C.M.B. Even with compression carried to its limit, it takes two lines to define a liar (being a person who utters an intentionally false statement) and three for a Bunsen burner. One is glad to note that custard must contain eggs and milk, and that bunkum may be spelt either phonetically or in accordance with its derivation. Stunt, dope, dole are given their modern significations. But to prolong this notice would be an injustice to so compendious a book.

[1] Compiled by George Ostler. Oxford, at the Clarendon Press. London: Humphrey Milford. 1930. Pp. 626. 2*s*.; on india paper, 2*s*. 6*d*.

Appointments.

BROWNE, JULIA M., M.B., B.Ch. N.U.I., D.P.H., has been appointed Medical Officer of Health, Stepney.

EASTWOOD, W. J., M.B., M.Ch. Liverp., Surgeon-in-charge of the Orthopædic Department, Royal Albert Edward Infirmary, Wigan.

POWELL, A. T. W., M.B., B.S. Lond., D.P.H., Medical Officer of Health, Walthamstow.

RAY, JOHN HOWSON, Ch.M. Manch., F.R.C.S. Eng., Honorary Consulting Surgeon to the Manchester Royal Infirmary.

SOUTHAM, A. H., M.D., M.Ch. Oxf., F.R.C.S. Eng., Honorary Assistant Surgeon, Manchester Royal Infirmary.

SWINDELLS, R. H., M.B., Ch.B. Manch., Medical Superintendent at New End Hospital, Hampstead.

UNGLEY, H. G., M.B., B.S. Durh., House Physician, Royal Victoria Infirmary, Newcastle.

Certifying Surgeons under the Factory and Workshop Acts: BROOKS, G. M., L.R.C.P. Lond., M.R.C.S. (Christchurch); JONES, A. M., L.R.C.P. Lond., M.R.C.S. (Llandudno); NICKSON, H. C., M.B., Ch.B. Birm. (Soham, Cambs); and SPARKS, C. W., L.R.C.P., M.R.C.S. (Matlock).

ROYAL NORTHERN HOSPITAL.—The 54,196 out-patients who were treated last year created such serious congestion that the enlargement and reconstruction of this department are a pressing need. There were 5752 in-patients who cost £3 17*s*. 8½*d*. each per week. The X ray department treated 9442 cases, and a training school for radiographers has been established. Investigation of the treatment of certain forms of cancer by means of activated fluorescein are stated to have had such satisfactory results that arrangements have been made at the request of the Cancer Committee of the Ministry of Health for the continuance of the treatment and for further research.

An Address

ON THE

INEXORABILITY OF THE LAW OF EVOLUTION

AS MANIFESTED IN MODERN MEDICINE.

Being the Annual Oration of the Medical Society of London given on May 12th, 1930,

BY SIR ARTHUR KEITH, M.D. ABERD., D.SC., LL.D., F.R.S.,

CONSERVATOR OF THE HUNTERIAN MUSEUM OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

MEDICAL LONDON FIFTY YEARS AGO.

FIFTY years ago a walk round Harley-street, Queen Anne-street, and Wimpole-street provided a medical visitor from the country with quite an interesting morning. The names on the door-plates were already familiar to him; for the greater part they were those of physicians and surgeons on the staffs of our leading hospitals. The physicians were mostly general consultants, but fame, he knew, had given some of them a reputation for being particularly skilled in certain diseases. The surgeons, too, exercised their art on all parts of the body, but already specialisation had taken hold and some were devoting themselves to particular disorders, such as those of the urino-genital system or even confining themselves to definite organs or systems of the body, such as eye, ear, nose and throat, teeth, skin, and such as required orthopædic treatment. Our visitor would also have come across the names of men who had made their reputation in the practice of midwifery and diseases of women—a specialty which in 1880 was at least a century old.

SPENCER'S LAW OF PROGRESS.

Our country friend, if he were familiar with Herbert Spencer's law of progress[1]—namely, that it was merely another name for increased specialisation—would have found an opportunity, in the three streets just named, of studying the application of Spencer's law to medicine. Of the 120 men who at that time had segregated themselves from the army of practitioners and taken up an abode in the three streets, some, although on the staffs of hospitals, did engage in family practice; others were not on any hospital staff but sought prestige in practice from their place of residence. The vast majority, however, were consulting physicians, surgeons, or obstetricians, or were specialists in one branch of these three main divisions. Their numbers represented the extent to which medical specialisation had spread in the year 1880.

The Rate at which Specialisation is Growing.

Were our visitor to return now, after an absence of 50 years, he would be astounded at the rate at which the wheel of evolution has moved in our medical world. Familiar names have disappeared from the doors of our three streets and been replaced by others—quite as noteworthy. The brass plates have decreased in size but greatly increased in number; a census shows that the 120 of 1880 have been replaced by 954 in 1930. While the medical population of London (and the same is true of the provinces) has only a little more than doubled its numbers in the last 50 years, the army of specialists, in the three streets already specified, has undergone an almost eightfold increase. Progress signifies that the number of young medical men who turn aside from general practice for a specialty becomes ever greater. Everyone whose name is affixed to a Harley-street door is not necessarily a specialist, but after making all allowance on this score, there are certainly seven specialists now where there was only one 50 years ago.

How specialisation has sped may also be seen from the fact that the Royal Society of Medicine finds it necessary to divide its proceedings into 24 sections. In our three streets we should certainly have to carry the subdivision farther and recognise about 35 branches of special practice in place of a bare ten of 50 years ago.

Ancillary Sciences Determine the Rate and Mode of Medical Progress.

When we look beneath the surface of things and try to ascertain why the face of medicine has become so changed (and we may be certain it will continue to change) we see that the cause lies, not so much in what medical men themselves are doing, as in what is being accomplished in certain branches of science—particularly in chemistry, physics, physiology, pathology, and biology. The application of modern chemistry to medicine has called into being at least two groups of specialists—perhaps three. Advances in physics have opened three or four new fields of medical practice—for the application of X rays, radium, light, and electricity. Biology—in which we may reckon bacteriology, immunology, and vaccine therapy—has made and is making such progress that a greater number of specially trained men becomes necessary as medical advisers. The technical methods of the physiologist, pharmacologist, and pathologist are being brought more and more into clinical practice, giving those skilled in their use opportunities for fresh departures in special practice.

While the impetus to specialisation come from advances made in the ancillary sciences our progress is also determined by the trend which events are taking in general medicine and surgery. As region after region of the body has become "safe for surgery" specialisation has been found to be necessary both for the patient's sake as well as for the further increase of knowledge. The same is true of medicine; knowledge regarding the ailments of each system of the body becomes so extensive and the technique needed for their full elucidation has grown so elaborate that it is no longer possible for one man to be master of all. As long as knowledge continues to increase and the methods employed to become more elaborate, division of labour—specialisation—must also increase.

The Direction of Progress.

Thus we see that "progress," which is another name for "evolution," has transformed the face of medicine as practised in the west end of London in the space of time easily covered by living memory. What will be its state in another fifty years? Let us see how far Herbert Spencer in 1880 could have foretold the state which medicine has actually reached in the three streets at the present time. He would have premised that the same spirit—a spirit of humanitarianism—would continue to urge medical men onwards in their attempt to relieve mankind of its load of suffering. He would have been certain, if this were so, that knowledge must increase and with each increase must come an augmentation of specialism. But he could not have foretold the direction in which specialism would spread. Our progress has been determined not by deliberate choice but by the force of circumstances, over which, for the greater part, medical men have had no control. That is what I mean by the "inexorability of the law of evolution as manifested in modern medicine." There is behind the medical army an irresistible pressure which thrusts it forward into the future and it must march, not as it would, but as it needs must.

Evolution as Seen in Medical Schools.

I have carried you to Harley-street to give me an opening for my thesis, but now, for the better understanding of the forces involved in medical progress,

[1] Progress, its Law and Cause. Westminster Review, 1857. Reprinted in Essays, Scientific, Political and Speculative, 1868, i., 1.

let us pay a visit to one of our larger teaching hospitals. Let us suppose that after having been in practice abroad for fifty years we are paying a first visit to our old hospital. What do we find? When we left the medical school of the hospital it was manned entirely —or almost entirely—by members of the hospital staff—surgeons and physicians. There were only two exceptions—a chemist and a biologist. Now we find the departments of the school greatly increased in number and every one of them presided over by a man who, although trained for the practice of medicine has elected to devote himself to teaching and research in one of its basal subjects. Physiology, taught by a surgeon when we left, has now widened its scope to such an extent that it has been found necessary to have it subdivided into three branches, each in charge of an expert. What strikes us most in our modern school is the birth of laboratories. Medicine has passed into a new period—the laboratory period. When we left there was only one—the dissecting room —but now we find the old school trebled in size to accommodate great rooms for the practical study of pathology, bacteriology, pharmacology, physiology, and chemistry. In place of a plain post-mortem room, in which physicians on the staff taught us how examinations on cadavers should be made, there is now a great institute of morbid anatomy over which a Director presides and has at his command a highly trained staff—all duly qualified medical men.

Evolution is at Work in our Hospitals.

In the hospital itself we find ample evidence of how potent a factor the laboratory has become in our modern advance. In place of little closets annexed to certain wards, each provided with a spirit lamp, a few test-tubes, and bottles of reagents, we now find suites of laboratories—bacteriological, chemical, pathological, cardiological—each of them requiring a highly skilled medical staff. We find the unit system and the team system at work—physicians, surgeons, and obstetricians, devoting their whole time to the treatment of hospital patients, to teaching, and to research. Amongst the members of the hospital staff, who have still to earn an income from consulting practice, the tendency to specialise has become more marked. The special departments of the hospital have grown in number, and everywhere we see evidence of increased technical outfit —demanding increased knowledge and skill. Under the working of Spencer's law of progress our medical schools and hospitals have undergone in these last fifty years a transformation which amounts to a revolution. The main agent in bringing about the evolutionary changes has been the introduction and spread of the "laboratory idea."

Humanitarianism as an Evolutionary Force.

Let us look for a moment at the underground forces which have speeded our hospitals and schools so quickly in the direction of division of labour and of specialisation. Harley-street in the olden days had to carry a heavy burden; it had to gather enough from the rich to provide itself with the means of treating the poor in hospitals and in teaching students the art of medicine. The rapid increase of knowledge, particularly in the basal subjects of medicine and more especially the introduction of technical methods of research, made it necessary to man medical schools with specialists—all of them more or less imbued with that kind of spirit which places opportunities for scientific inquiry above those which lead to augmentation of income.

The period of the missionary professor in our medical schools was a brief one. The war brought about a financial crisis in the schools and the State began to take a hand in their affairs. This intervention was impelled by two motives. There was, in the first place, a "heart" motive—the humanitarian principle that the poor should have, of its own right, as free an access to the best available means of treatment as the rich. The second was a "head" motive—namely, that every advance in medicine brought a clear gain to the public at large—which is the State. Through State subsidies, dispensed by various Government departments, but particularly by the University Grants Committee, it became possible to staff hospital schools and certain hospital services with medical men who could devote their lives to special branches of medical knowledge. Government has provided the sinews of war and the vanguard of the medical army presses forwards at an unprecedented pace, but neither Government nor any power can determine or regulate the direction of the advance; that depends on what happens at a thousand points along the fighting front. Of one thing, however, we can be certain: every advance made in our medical schools will have its repercussion in the Harley-street quarter of our larger cities. The initiative has passed, or is passing, from the clinician to the laboratory worker; the laboratory has become the "pace-maker" of medical progress.

The Divorce of Research from Teaching.

My aim is to ascertain how far Spencer's law of progress helps us to understand developments which are happening under our eyes in our medical world. There has been an unparalleled increase in our knowledge; that has been accompanied, as Spencer postulated would be the case, by a necessary increase in specialisation. In our present ranks I see a separation of duties, a division of labour, which although I know it to be inevitable, yet fills me nevertheless with some pangs of regret. It is the separation of teaching from research. Time was when games were the pastimes of amateurs; to develop games to their highest pitch the professional became nesessary. It was also so with research; it was the pastime of the amateurs. Fifty years ago, if a medical man had a bent for investigation, he sought for a teaching post which would permit him to earn his bread and butter and at the same time offer him the opportunities he desired. Such a man became a source of inspiration to his students—particularly to his best students. To gain his end, and for the advantage of his subject, he was willing to offer up his wife and family as an economic sacrifice. There was in these sturdy pioneers a quality which commands our highest respect and we shall say good-bye to the type with the utmost regret. Go it must I fear; the imperious law of progress, which dominates science as well as sport, demands the replacement of the amateur by the professional.

Professional Research.

The introduction of professionalism into medical research has been made possible by subsidies from State as well as from private sources. That such endowments are speeding up the rate of medical progress there is no doubt; we have only to consult the pages of the annual reports issued by the Medical Research Council or to read the address which Sir Walter Fletcher recently delivered before the British Science Guild[2] to have ample confirmation of my contention. The Medical Research Council, and the Royal Society to lesser degree, are, to borrow Sir Walter's simile, watering the tree on which the fruits of Science grow. They have planted in their research orchards only such trees as have proved their bearing capacity and the results are promising. Nevertheless, the gardeners can but tend the trees; they cannot change their nature nor alter by regulation the kind of fruit they will produce. They can but water the ground and hope in the autumn to gather a profitable crop.

The introduction of professionalism into research illustrates very well a corollary of Spencer's law of progress. This far-seeing Victorian realised that every new departure, every discovery or advance, was attended by a multitude of secondary effects. The segregation of our most gifted investigators is impoverishing the medical staffs of our universities and schools. Our best teachers desire to be relieved

[2] See Nature, 1929, cxxiv., 795; also Brit. Med. Jour., 1929, ii., 993.

of the duties of their office in order that they may devote their whole time to experiment or other forms of inquiry. The gift of teaching, of inspiring young men, of collating and desseminating knowledge, is being ranked below that of the ability to research. The ultimate result of assigning an inferior position to the teacher and to the bookmaker is as likely, in the long run, to impede the progress of medicine as to accelerate it.

Results of Progress on the Output of Medical Literature.

Another result is a curious one. So prolific is the output of published researches from our laboratories that a regiment of specially trained men has become necessary to deal with it and make its assimilation by the medical profession possible. How great that output has become may be seen from recent numbers of the *Quarterly Cumulative Index Medicus*—for which we are beholden to our brethren in America. There are now over 2000 medical journals and periodicals; to index the articles appearing in these journals in the first six months of 1929, and the titles of medical books published in the same period, required 100,000 separate entries—these entries filling a volume of 1311 pages. A friend, who has confined his researches to a small but important gland of the body, told me that the literature relating to it had become so vast that he could read only part of it. And yet the progress of medicine demands that the output will keep expanding at an ever-increasing rate and specialisation in research becomes more and more necessary.

There is no Alternative.

What, you may ask, is to be the end of it all? There is no turning back; we must press forwards. Will then our specialisation reach such a growth that, like the monstrous antlers of the Irish deer, it will sap and endanger the life of the whole body of medicine. There is a safeguard. When our specialisation reaches a stage at which its upkeep passes beyond the powers of the public and private purse, then perforce we shall have to limit our ambitions and discover more economical methods of attaining our ends. As yet we are not within sight of such a crisis.

Coördination is a Necessary Constituent of Progress.

Up to this point I have been discussing the manifestations of progress as seen in the Harley-street quarters of our greater cities, in our medical schools and hospitals, and in our subsidised laboratories. In all three quarters we find medical men pressing forwards in search of new funds of knowledge and as they press becoming subdivided more and more into separate groups. We have, in these instances, been studying only one of the factors of medical progress; there is another which Spencer perceived was equally inevitable. Specialisation, if it worked unchecked, would tend to break up our medical forces and dissipate their strength in confusion. Hence we find, in the progress of our profession, just as in the evolution of the earlier animal organisations, there comes into play certain influences, exerted by a crude form of nervous system. An astute student of the evolution of medicine, if he had visited London in 1880, would have perceived that this centre had already come into being in the form of a Department of State, situated in Whitehall—the Local Government Board. He would have found London already divided into 52 districts—each with a medical officer of health—controlled more or less indirectly by the nervous centre in Whitehall. All England, Wales, and Scotland had then become so divided and a multitude of medical men, most of whom while still continuing to attend to their patients, served also as members of a health army, and carried out a policy formulated or suggested in Whitehall.

The Process of Integration.

Unification or integration is just as necessary an ingredient of "progress" as the specialisation or separation. The influences which tend to bring about the unification of our medical army, like most of the inventions which alter medical practice, arise not inside our medical ranks but outside them. Before the middle of the nineteenth century it became evident to British statesmen that the country could not drift along exposing itself to plagues and pests, to contaminated water and adulterated foods, to overflowing cesspools, and to drains which led nowhere. Government began tentatively by calling into being a new kind of medical specialist—health officers. Presently it was found to be necessary to coördinate the activities of the men so enrolled. Even in 1880 this brain, then represented by the Local Government Board in Whitehall, was a small and simple fashioned organ. The deliberative and executive areas of its cortex were composed of laymen; 11 medical officers entered into its texture and were relegated entirely to the sensory or recipient areas. They were advisory in function at the best. No doubt the reformers who placed all our public health acts on the Statute book had to fight hard and long; they fought with head and heart, and deserved their victory, but as they gained it, it never occurred to them they were being impelled by the force of circumstances and were unconscious exponents of a scheme of evolution. Health reformation was initiated outside the ranks of our profession, but it introduced into our ranks the first step towards their unification.

We are the Slaves of Circumstance.

What I am seeking to make clear is that in all our advances we are the slaves of circumstance rather than masters of our fate. You may ask: Does not the Ministry of Health which succeeded the Local Government Board in 1919 determine the direction in which we shall advance? Lately I listened to a speech which was broadcast by an able member of Sir George Newman's staff—Dr. T. Carnwath. In this speech the policy of the Ministry of Health was outlined. The Ministry watches how health measures, recently sanctioned by Parliament, work out in practice. Defects become apparent, the Ministry studies how they can be mended. Local authorities may apply for a special bill to meet some local need; if leave is granted, the Ministry notes the effects. If benefits accrue, then steps are taken to extend them to the whole country. The Ministry does not create its opportunities; it waits until they come and then utilises them for an "advance." Sir George Newman and Sir Walter Fletcher have both to wait for their opportunities. They wait patiently for them and then when they occur, apply their genius in utilising them for the improvement of national health.

Progress Implies an Increasing Integration.

Every step taken by Parliament leads towards a more perfect unification of our British medical army—in which 54,000 recruits are now enrolled. We are far enough away from the angry discussions which arose in our ranks when Mr. Lloyd George successfully carried the National Insurance Act of 1911, to take a philosophical view of what then happened. We see now that it was the inevitable that happened; it was but another turn in the screw of that evolutionary movement which tends towards the unification—the integration of medicine. It was a continuation of that "policy" of the nineteenth century which broadened the franchise to its present limits, gave us compulsory education, established the medical inspection of schools, and more recently gave services for the welfare of mothers and babies. The Local Government Act which now brings the staffs of our hospitals more directly under a central authority is but another turn of the same evolutionary wheel. The art of healing, in its modern development, is going steadily through the stages which transformed a brood of discrete independent protozoa into the coördinated complexity of cells which form the body of a living animal.

The Law of Evolution.

In this lecture I have been applying a law—the law of animal evolution—to the complex affairs of modern medicine. Given human nature as it is—a nature

which demands and ever will demand—that the poor must and shall have access, so far as health is concerned, to all the privileges the rich can buy—that, at all costs, suffering must be relieved, then medical progress must go on and follow the path already chosen. Further progress consists, in our modern interpretation, of an ever-increasing degree of specialisation and in an ever-increasing degree of coördination or unification. We cannot escape State control in the long run—however much we may regret the loss of personal liberty which is thereby entailed. What I would especially lay stress on is that medicine is not so free to choose its path into the future as most of us think it is. We may mould circumstances to our wills on some occasions but in most we are carried along in the irresistible current of events. I do not mean we should, like fatalists, cease to strive to steer a course. Nevertheless, in things medical, as in all mundane affairs, the main feature of the law of evolution is its inexorability.

An Address

ENTITLED

WHAT CAN WE EXPECT FROM RADIUM IN THE TREATMENT OF CANCER? *

BY J. MURDOCH, M.D.,

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ALL therapeutic methods pass through periods of exaggerated enthusiasm alternating with periods of unjustified scepticism, and from time to time it is important to get a clear, unbiased view of things as they actually are and the results that may be expected. Statistics may be made to prove anything, but for radium treatment there are records collected under such very rigid conditions that they might well serve as an example in other fields of medicine, and it is remarkable how similar are the results obtained in the various big radium clinics, although the methods used are entirely different.

We do not know anything definite about the intimate phenomena of the effects of radiation on living cells. It is probable that the biological effects are due to ionisation caused by photoelectrons and Compton electrons produced in the tissues under radiation. Many authors believe that there is an increase of permeability of the cell membrane, and it is certain that the protoplasm undergoes certain modifications. Numerous histological researches have shown the particular effects on the nucleus. At the Brussels Centre, Dustin has made large numbers of biopsies—more than a hundred in certain cases—and determined the variations of the karyokinetic index as a function both of the dose received and the time elapsed since irradiation. He has observed a strict parallelism between the curves of mitoses and the clinical effects obtained. The histological effects of X rays and gamma rays are very similar. Three different stages can be observed. During the first stage the number of mitoses decreases considerably and in favourable cases they disappear completely. This stage begins a few hours after irradiation and lasts from two to seven days according to the nature of the tumour and the dose of radiation applied; it is followed by the appearance of a large amount of pyknotic debris in the tumour. The principal feature of the second stage is the appearance of a wave of atypical mitosis lasting a few days. This wave seems to be an unavoidable sequel to the first stage, whether radiation is continued or not; nor can the continuity of irradiation shorten its evolution. These atypical mitoses are followed by total or subtotal mitotic arrest. The third stage is characterised by the appearance of cellular monstrosities, very marked in squamous-cell epitheliomas, less so in cylindrical epitheliomas. At this time the tumour diminishes in volume and its disappearance is accompanied by cellular lyses and invasion by poly-

FIG. 1.

Epithelioma of eyelid (A) before, and (B) after treatment.

nuclear neutrophil cells. Either all the cancerous cells are affected and destroyed during the three stages which means complete cure, or the majority of the cells are killed and the surviving ones embedded in sclerotic tissue where they may remain inactive for a very long period; or the mitotic arrest is sooner or later followed by a recurrence.

One of the most striking features of recurrence is a hyperkinetic stage. The divisional activity of the cells is then invariably higher than it had been in the primary tumour before any treatment. Another feature is a relative diminution of radiosensitivity of the cancerous cells; mitotic cells are still sensitive to radiation, but it is much more difficult if not impossible, to ensure complete mitotic arrest. Certain cells seem to have become immune to radium and will give rise to new recurrences. It is impossible histologically to foresee the time of recurrence; for as soon as it is exposed to radiation the whole kinetic rhythm of the tumour is upset for a long time. The process varies according to the histological nature of the cancer. Squamous-cell epitheliomas show the three typical stages, the number of mitoses falling either rapidly or by bounds. These phenomena are usually followed by a strong "evolutionary maturation" and the arrest of division involves these cells in a differentiation that kills them. The cancers of the digestive tube form a much less homogeneous group than the squamous-cell epitheliomas. The differences are particularly marked between the various kinds of tumours of the rectum. In adenocarcinomas the rapid maturation is almost totally absent. This is probably one of the principal explanations of the radio-resistance of tumours of the digestive tract. An epiderm cell engaged in keratinic differentiation may give rise to a few atypical mitoses but will never constitute a fertile stock. On the other hand, a mucous cell may, upon finishing secretion, come to a glandular rest and then start again on its karyokinetic activity. In most of the adenocarcinomas it is very difficult to stop the normal mitoses by radiation. Mitotic activity starts again more rapidly and more violently than in the case of the squamous-cell epithelioma, and the waves of atypical mitosis are much less striking.

These histological researches explain why squamous-cell epitheliomas respond more favourably to radiation than adenocarcinomas. But it is not sufficient for a tumour to be radio-sensitive in order that the patient may be cured by radiation. It must also be accessible and the organ involved must be able to stand the treatment. It is easy, therefore, to cure epithelioma of the skin, penis, lips, buccal mucosa, tongue, and uterus, but results are much less favourable in epitheliomas of the pharynx and œsophagus.

* Delivered at the University of Sheffield, in connexion with the Yorkshire branch of the British Empire Cancer Campaign, on May 6th, 1930.

The methods in use at the present time are: 1. Surface applications at various distances from the skin. 2. Interstitial irradiation obtained by needling the tumour. 3. Intracavitary methods in which radium is introduced into the natural cavities. 4. Distance treatment by the "bomb" method (telecurietherapy).

1. Cancer of the Skin and Lips.

Although certain authors report excellent results from rontgentherapy alone, recovery seems more certainly and more regularly obtained by using radium than by using X rays. Cases of spindle-cell epithelioma known to be less radio-sensitive to X rays heal in just as large a proportion as those of basal-cell epithelioma when treated by radium therapy. Why is radium superior? Is its superiority due to the shorter wave-length of gamma rays and are the biological effects of radium different from those of X rays? Or is the better result due to the difference in the time of application, that is to say, to the fact that radium is continuously applied for several days, whereas radiation by X rays lasts a few minutes only? The time of application certainly has considerable influence. According to Regaud, tumour cells are radio-sensitive during cellular division only. A neoplasm composed of short-lived cells dividing at short intervals is more radio-sensitive to a short irradiation than a cancer composed of cells dividing at longer intervals, for the evident reason that a larger number of cells in mitosis are affected by radiation. Mascherpa has shown that the time between two subsequent mitoses is 10 to 12 hours in basal cell epithelioma and 8 to 10 days in spindle-cell epithelioma. The difference in radio-sensitivity of the two varieties of epithelioma would thus disappear as a consequence of continuous radiation. According to recent research work by Jona, Jüngling, Glasser, and Stahel, it seems probable that, in order to produce the same amount of biological

Fig. 2.

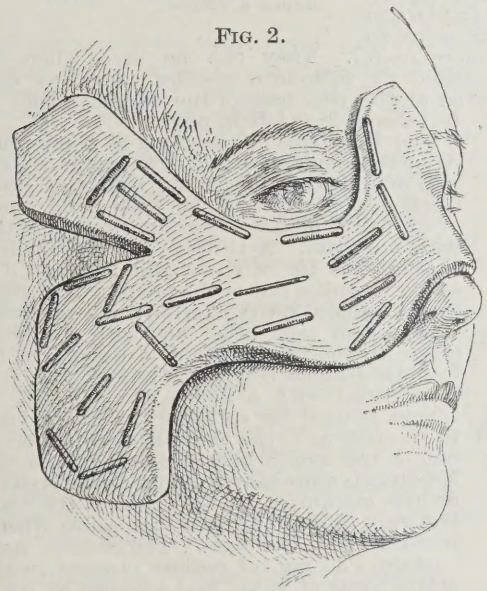


Diagram showing arrangement of radium tubes in a mould applied to the face.

reaction, such as an erythema of the skin for instance, it is necessary to apply to the tissues a much larger amount of energy in the form of gamma rays than of X rays. The proportion is about one to four. The energy of the quanta may also have an influence.

The technique we employ is determined by the localisation and clinical form of the tumour. When we have to deal with a small superficial lesion in a part where radiation must be strictly limited on account of the proximity of especially sensitive organs, we sometimes use needling, that is to say, interstitial radiation. A typical case for this treatment is a small epithelioma of the eyelid. By this method of radiation the tumour tissues absorb a very large amount of energy in the immediate vicinity of the needle, and lesions of the sensitive parts of the eye, viz., the conjunctiva and the cornea, can be avoided (Fig. 1). When the lesion is larger but still superficial, and situated in regions easily accessible to radiation such as the cheeks, the forehead, or the chin, we apply to the surface a certain number of needles embedded in a cast of radioplastin, moulded on to the tumour. In this juxta-cutaneous irradiation the surface tissues absorb a large amount of energy, whereas the subcutaneous tissues are much less affected.

When the tumour is infiltrating it is necessary to put the radium at a greater distance from the skin so as to ensure more homogeneous radiation in the depth of the tissues. Measurements show that whenever radium is placed at a short distance from the skin, the curve of absorbed energy is very unequal and the radium must be applied from a distance of 1 cm., or preferably 2–3 cm., to make the irradiation homogeneous. The distance between radium and skin is ensured by a moulding of Columbia wax or radioplastin, 1 to 3 cm. thick and moulded on to the tumour while warm (Fig. 2). To discover the most favourable arrangement of the tubes on the surface of the moulding may be a complex problem and take considerable time. According to a method perfected by Prof. Stahel, physicist to the Brussels Centre, the doses applied to the skin are calculated in units of energy absorbed per cubic centimetre of tissue. We hope that some day this method may be adopted generally. The unit we have adopted is the erg, the energy unit of the C.G.S. system, and we express the energies absorbed in ergs/c.cm.

A dose of 450,000 ergs/c.cm. produces slight erythema and pigmentation. This reaction is practically the same as the one obtained in deep X ray therapy after application of 600 r. international given in one séance (180 Kv. filtered by 0·5 mm. of copper and 1 mm. of aluminium). For X rays, however, this reaction is produced after administration of 96,000 ergs/c.cm. only. A dose of 550,000 ergs/c.cm. causes a frank erythema not followed by desquamation, but followed by brown pigmentation. A dose of 600,000 ergs/c.cm. causes a deep red erythema appearing at an earlier stage and followed by slight desquamation and deep pigmentation. A dose of 700,000 to 900,000 ergs/c.cm. causes strong radio-epidermitis with formation of blisters and very deep pigmentation. It is the maximum dose that we use in treating skin tumours.

The results, for cases without glandular metastasis, are very encouraging. We cure about 90 per cent. of cutaneous cancers of the face and lips. Of the deeply infiltrating tumours we cure about 50 per cent., but this last class includes a large percentage of hopeless and quite inoperable cases. One may say that cancer of the skin is never too large nor too advanced for treatment by radium therapy.

A patient was treated for a large basal cell epithelioma involving the greater part of the left side of the neck; the sternomastoid muscle was partly destroyed and the carotid arteries were barely covered by a thin layer of tissue. A cast was made in radioplastin and radiation was effected at 2 cm. distance. The amount of energy administered to the middle part of the lesion amounted to from 700,000 to 800,000 ergs/c.cm., and on the border of the tumour from 600,000 to 700,000 ergs/c.cm. The lesion was completely healed eight weeks after treatment.

2. Cancer of the Tongue.

Cancer of the tongue is a form of cancer that has been willingly handed over by the surgeon to the radiologist. Surgical intervention causes an extensive mutilation, which patients desire to escape; the age may contraindicate the operation; the pulmonary complications are frequent, and not always to be avoided even by the use of local anæsthesia; and even if operation is successful, local and glandular recurrences only too often cause terrible deaths. Tongue cancers are not radio-sensitive; they are nearly always spindle-celled, and much more seldom basal-celled epitheliomas, and mixed varieties are common. Tumours taking origin in the lingual glands are very rare. The radio-sensitivity of glandular metastases is even less than that of the primary lesion, a fact which unfavourably influences statistics to an enormous extent, even where it has been possible to cure the primary lesion

After a first treatment, acquired radio-resistance is very marked, and we prefer the diathermy loop to a second radium application when the recurrence is not too large. Nevertheless, in certain favourable cases a second treatment with radium may prove successful. The radio-resistance of cancer of the tongue accounts for the failure of deep X ray therapy. Direct radiation of the tongue with X rays has been tried, but the technique is very difficult and can only be applied in exceptional cases. The technique of transcutaneous X ray radiation of the tongue has been carefully worked out by Jüngling. By means of mouldings of radioplastin he gives a geometrical shape to the region of the neck, thus greatly facilitating the construction of a radiation scheme. It is evident that the whole region must be radiated in a very homogeneous manner while making due allowance for the protection of certain especially sensitive organs such as the salivary glands, the lower maxilla, and the thyroid cartilage. Heavy radiation of the salivary glands may stop their secretion absolutely. This seriously affects the general health of the patient, and it is necessary to preserve at least one of the large salivary glands. Too intense radiation of the lower maxilla causes radio-necrosis, which may develop a few months after radiation as the result of a slight trauma, such as the extraction of a tooth, or even spontaneously. The bone is very sensitive to radiation and doses which only cause atrophy of the skin without ulceration may lead to complete elimination of the maxilla through obliterative endarteritis and subsequent necrosis. Late radio-necrosis of the thyroid cartilage must also be carefully avoided, as it may cause death.

For these technical reasons and owing to the bad results obtained by deep rontgentherapy, most authors prefer local radium therapy. It is only under special circumstances, when it is impossible to use radium on account of localisation at the base of the tongue or the extent of the lesions, that it is advisable to use radiation by means of strongly filtered X rays, the application being spread over a long period, according to the technique perfected by Coutard. These

FIG. 3.

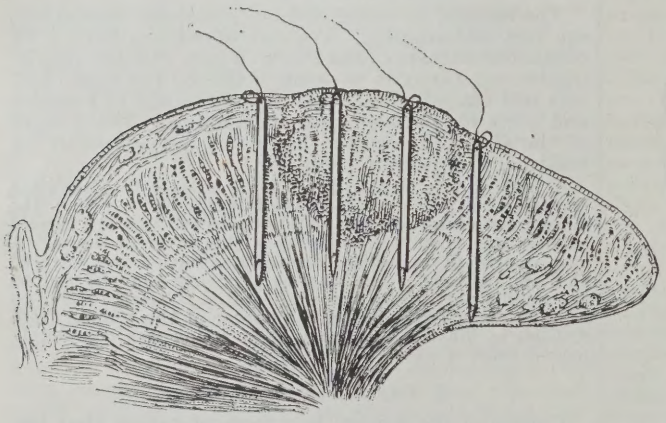


Diagram showing insertion of radium needles in the tongue.

patients may also derive benefit from telecurietherapy by means of the radium bomb, placed at 10 or 12 cm. from the skin.

The methods of radium therapy of cancer of the tongue have been modified considerably. Formerly radium was applied to the surface, but it is now generally introduced into the tumour by platinum needles; the method was invented and perfected by Regaud. Only where the tongue is completely involved and when needling is impossible is surface radiation by an ebonite support useful palliative treatment. Capillary glass tubes filled with emanation have been used; they remain in the tongue permanently. Radio-activity of emanation drops to one-half its strength in 3¾ days and is reduced to about one-tenth of its original intensity after 13 days. These seeds measure about 2 mm. in length and a large portion of the beta rays pass through their glass walls, which are only 0·2 mm. thick. The disadvantages of the method are largely due to lack of screening; beta rays produce necrosis and destroy healthy tissue as well as the neoplasm. The selective effect of the gamma rays is thus completely lost; moreover, radiation is not homogeneous and, although the results reported by Janeway and Quick are interesting, the method appears to have no future.

FIG. 4.

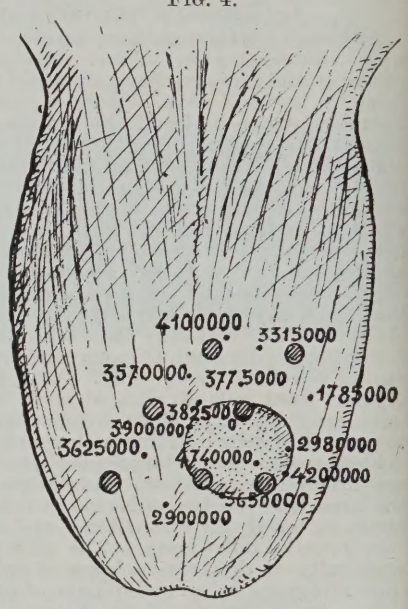


Diagram of central horizontal section of tongue showing amounts of energy absorbed from radium needles in and around a tumour.

Platinum seeds seem to be more useful. They can be used where it is impossible to introduce needles, such as cancer situated at the very base of the tongue. They may be taken out or left in place.

The technique of needling is very simple. After thorough cleansing of the mouth, extraction of all decayed teeth and also of all healthy teeth in contact with the lesion, and removal of all metal pieces, we secure local anæsthesia with novocain. A thread of thick silk is put through the tip of the tongue so that it can easily be pulled out of the mouth. The needles are introduced into the growth at a distance of 1 cm. from each other and into the healthy tissue around the growth at a distance of 1 cm. from the tumour (Fig. 3). The eye of the needle is provided with a double thread. The thin thread is used for suturing the radium needle to the tongue; the thicker thread is brought out of the mouth and attached to the cheek. Needling is quite easy when the lesion is situated on the margin or on the back of the tongue, but very difficult or even impossible when the tumour is at the base. The needles usually contain 1·33 mg. of radium element, with an active focus of 20 m., and screened by 0·5 mm. of platinum. The application is calculated in such a way that each cubic centimetre of tissue of the tumour receives a dose equivalent to from 0·85 to 1·0 millicuries destroyed (mc. d.)—i.e., from 100 to 132 milligramme hours (mg.h.). Generally speaking, the period of radiation varies between 4 and 8 days. Three weeks after this treatment the lesion and the adjoining tissues are covered with a white coating; this reaction comes to an end in six to eight weeks. Although the amount of energy absorbed is considerable, cicatrisation is not followed either by loss of substance or by considerable fibrosis.

A deeply infiltrating tumour covering approximately a surface of 1·5 cm. was treated by seven needles of 1·33 mg. Three needles were planted into the tumour and four in the surrounding healthy tissue. The needles remained in place

for eight days, and the quantity of energy emitted at the source equalled 13·44 mc. destroyed, or 1785 mg. h. Under these conditions the calculations made by means of the isodoses plans show that at the level of the central horizontal section (Fig. 4) the amount of energy absorbed varies between 3,000,000 and 5,000,000 ergs/c.cm. in the tumour itself and still amounts to 3,000,000 ergs at a distance of 1 cm. from its border. At the surface of the tongue (Fig. 5) the amount of energy absorbed by the tumour varies between 2,000,000 and 2,500,000 ergs/c.cm., and is equal to 1,500,000 ergs/c.cm. at 1 cm. from the limit of the tumour. The tumour thus absorbed quantities of energy amounting to up to ten times the value of an erythema dose in the depth and from 2½ to 4 times the value of this dose at the level of the mucosa. The progress of cicatrisation was normal. The patient died eight months afterwards of brain metastasis without recurrence of the tongue lesion or any radionecrosis.

FIG. 5.

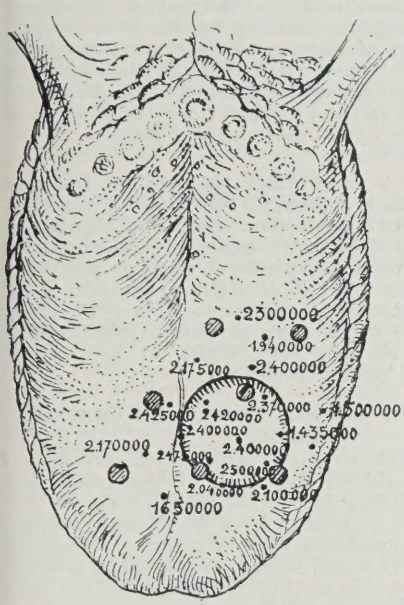


Diagram showing absorption of energy at surface of the tongue.

Regaud is the originator of this method and has published the most reliable statistics. Amongst 287 cases treated from 1920 to 1925, 80 per cent. of which were inoperable, 27 per cent. have completely recovered, and 20 per cent. of the patients recovered locally but died afterwards of glandular recurrences. In about 50 per cent. of all cases, therefore, the local lesion can be cured, and in 25 per cent. of all cases, both operable and inoperable, permanent recovery is ensured. These figures compare favourably with surgical statistics.

Glandular metastases considerably darken the prognosis. We have treated them by many methods without much success. Radiation before or after block dissection does not give reliable results, whether applied by X rays, "collars" of radium, or telecurietherapy with the bomb. We have lately adopted a radio-surgical method based on a block dissection followed by the introduction of needles covered with rubber sheeting into the whole area threatened by recurrence. This method has been employed for so short a time that it is not possible yet to have a definite opinion on its efficiency.

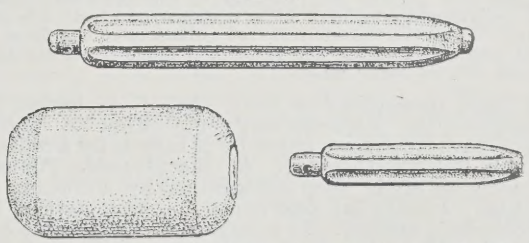
3. CANCER OF THE UTERINE CERVIX.

Cancer of the uterine cervix was one of the first deep cancers successfully treated by radium therapy. The good results obtained are due primarily to the anatomical disposition of the organ, which is especially favourable to the application of radium, as well as to the considerable amount of radiation that can be applied to the mucosa of the vagina and the uterus and to the uterine muscle. Deep X ray methods have also reached a high degree of perfection, especially in Germany, and excellent results have been obtained by using deep X rays alone. Far from being opposed to each other, the two methods are probably destined in the future to work together more and more.

Statistics concerning cures of cancer of the cervix should only include cases that have been under observation for at least five years, and the methods used in the various centres should not change if we are to get a good idea of their value. At the Brussels Tumour Centre we have maintained practically the same technique since October, 1925, although the results published by other clinics sometimes tempted us to modify it. It differs from Regaud's method only in details. It is an "intra-cavitary" method; that is to say, local radiation is effected by introducing radium tubes into the uterus and the vagina. To this radiation by gamma rays we add transcutaneous radiation by deep X rays. It may seem tempting at first sight to destroy an epithelioma of the cervix by introducing needles directly into the tumour. The doses of energy absorbed by the cancerous tissue when treated by needling are certainly very considerable, but various disadvantages have led us to abandoned this method, which is still used in certain centres. Those who tried it first, Regaud and his associates, also Cahen and Delporte, have admitted its disadvantages—viz., the difficulty of disposing the needles correctly, the impossibility of judging the size of the tumour, and the danger of coalescence of the needles which, when the tumour is destroyed, come together in a bundle and produce irregular irradiation and sometimes radionecrosis.

Patients undergo a special examination by the surgeon and the radiologist, and we invariably practise a biopsy at the time of the first examination. Before radium treatment they are watched for 24 hours at least. If there is any fever we put off the treatment and try to bring about general and local disinfection by all means at our disposal. We do not apply radium until the temperature has become normal. If fever continues in spite of our efforts, we apply X rays before local treatment, which sometimes succeeds in cleaning up the local lesion but may cause narrowing of the cervical canal through sclerosis, and so make intra-uterine treatment more difficult. Dilatation of the cervix sometimes causes a rise in the temperature, and we have reduced this manœuvre to a minimum by inventing a small apparatus which differs slightly from the intra-uterine tubes used in other clinics. It is a simple aluminium tube, the walls of which are grooved to ensure drainage. One end is tapered so that it can be inserted very easily into the uterus with a minimum of dilatation. The filtration of the aluminium is negligible and the

FIG. 6.



Aluminium tubes for insertion into the uterus and cork container for vaginal application.

tube only serves to maintain the necessary distance between the radium and the mucosa of the uterus. There are two models of this intra-uterine tube, —viz., one holding a tube of 6·66 mg. filtered by 1 mm. of platinum, and another holding two tubes. We use either the one or the other according to the length of the uterine cavity measured by means of the hysterometer. Vaginal radiation is effected by means of two tubes of 13·33 mg., screened by 2 mm. of platinum; they are contained in cork stoppers (of the Regaud type) which ensure a distance of 1 cm. between the walls of the tubes and the tissues (Fig. 6).

When the condition of the cervix uteri allows us to find the intracervical canal easily, the intra-uterine and vaginal tubes are placed at the same time. When it is impossible to introduce the uterine tube, the two vaginal tubes are put in first in the hope that the cervical canal may become more easily accessible when a portion of the tumour has disappeared.

Recently we have come more and more to use this two-stage application. The intra-uterine tube is left in situ for nine days; the energy emitted at the source equals 21·6 mc.d., or 2877 mg.h. The vaginal tubes are left in place five days, the energy emitted at the source being 24 mc.d., or 3200 mg.h. For local treatment we thus apply 45·6 mc.d., or 6077mg.h. These doses are somewhat lower than those recommended by Regaud, who applies to the tumour 60 mc. in five days in all (Fig. 7).

The direct measurements of energy actually absorbed by the tissues, determined according to Stahel's method and expressed in ergs/c.cm., show interesting curves. These measurements, taken in a water phantom, show that the uterine mucosa absorbs up to 5,000,000 ergs/c.cm. in the immediate vicinity of the intra-uterine tube—viz., eight times the erythema dose. The vaginal mucosa absorbs between 2 and 3 million ergs/c.cm. The cervix absorbs 2 to 5 million ergs/c.cm. The absorption of quantities of energy amounting to eight times the value of the erythema dose does not cause any exaggerated reaction. Its climax is usually reached during the course of the second week, and cicatrisation comes to an end after six weeks. The distribution of the isodoses at the level of the uterus and the parametria shows how quickly the intensity of the absorbed energy of radiation decreases; at a distance of about 4·5 cm. from the cervix the intensity of radiation at the level of the parametria equals the value of a single erythema dose —viz 600,000 ergs/c.cm.

FIG. 7.

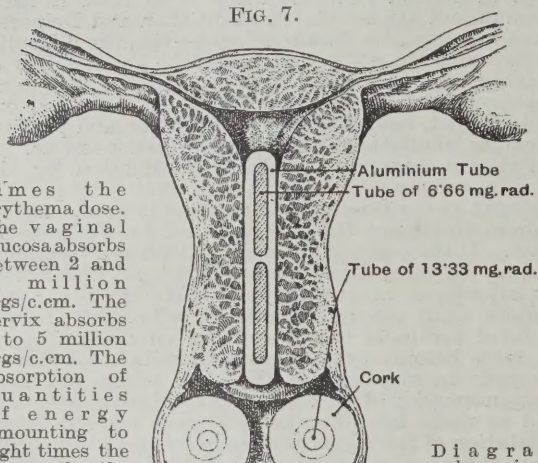


Diagram showing radium tubes inserted in the uterus and vagina.

These measurements show that it is logical to complete the intra-cavitary application by transcutaneous treatment, either by X rays or by a radium bomb (telecurietherapy). At the Brussels Tumour Centre we apply deep rontgentherapy according to a plan of radiation determined for each patient by Holfelder's method. It is applied to the patient one month after local treatment. The voltage equals 186 Kv. (constant tension); the filtration is 0·5 mm. of copper and 1 mm. of aluminium. By each of the four "portals of entry" 800 r int. are applied. The treatment is spread over eight days. We estimate the quantity thus applied to the whole tumour at 800 r int., to which the amount of energy applied by radium must, of course, be added. Most authors recognise the superiority of such a combined method to both the local and transcutaneous methods employed separately. Forssell, however, relies mainly on local treatment, and Wintz of Erlangen has recently reported extraordinarily favourable results obtained by deep rontgentherapy alone.

Telecurietherapy with the bomb of 4 g. or more radium may appear at first sight to be the ideal method for treating cancer of the uterus, combining both the high degree of homogeneity of the X rays and the lesser wave-length of the gamma rays. All who have tried this method, however, seem to have come back to the local applications. It will probably never be possible to apply to the cervix, by a method that necessitates the irradiation of the skin, the very high doses that can be applied by the intracavitary method, even with cross-firing. Used like X rays, as a complement to the local irradiation, however, the method has given good results.

Hysterectomy after radium therapy has not given us very good results, and we have, therefore, given it up entirely. A radio-surgical method recommended by Cahen and Delporte consists in the introduction, after laparotomy, of radium needles into the parametria and the uterus, when local application has not been sufficient to cure the patient. In the hands of its authors this method has given very good results, for in inoperable cases they have obtained up to 40 per cent. of cures.

The technique is of primary importance, but the measure of success is influenced by other causes such as the general and local condition, the degree of infection, and the state of the adnexa. Abnormalities in shape and a previous operation, such as hysterectomy, may render the application of radium very difficult and sometimes even impossible. Previous treatments either by X rays or radium also render the prospect of success very slight on account of radio-vaccination of the tissues.

THE RESULTS OF RADIUM THERAPY IN CERVICAL CANCER.

It is now possible to appreciate the exact value of the method, thanks to the work of the League of Nations subcommittee for radiotherapy of cancer.

These statistics, published by Forssell and Regaud, prove that it is possible to cure 40 per cent. of all the operable cases and to save 16 per cent. of all inoperable cases, and it is certain that their results will improve in the future, seeing that the techniques have been perfected since 1923, and that future statistics will reflect these improvements. The statistics which we have provisionally established for the Brussels Centre cannot be compared to the five-year results of Regaud and Forssall. We do not record five-year cures, and it is certain that our percentage of cured cases will decrease in the future.

In 1925 ten cases were treated; four were operable, and of these three have remained well for four years. Three were border-line cases; they are all free from symptoms after four years. Two were frankly desperate cases; they both died during the first year. The total survival after four years is, therefore, 60 per cent. In 1926 we treated 49 cases, of which 11 were operable; six of these cases cannot be included in the statistics for various reasons, and are considered as lost. Of the remainder, 27·2 per cent. are at present free from symptoms. Of the 14 border-line cases, six (42·8 per cent.) are free from symptoms after three years. Twenty-two were frankly inoperable. Thirteen of them received a palliative irradiation with X rays only and died during the first year, and seven had complete treatment; three are well after three years (42·8 per cent.); two were operated upon after their treatment and are well. Of these 22 inoperable cases, 28·5 per cent. are still living. If we eliminate those who were quite hopeless, and only received palliative treatment, 50 per cent. are well after three years. The total three years' survival, including all cases, is 28·5 per cent. In 1927 we treated 47 cases. Of the 12 operable cases, nine are well, giving a two-year cure of 75 per cent. Of the border-line cases, five are well, giving a two-year cure of 45 per cent. Twenty-two were inoperable; three were well, so that the two-year cure is 13·6 per cent., and the total two-year survival-rate 40·4 per cent. In 1928 we treated 61 cases. Sixteen were operable, and of these eight are well: a one-year's cure of 50 per cent. Of 21 border-line cases, ten are well: 47·6 per cent. Of 22 inoperable cases, ten are living: a one-year's cure of 45·4 per cent. The total one year's survival-rate is, therefore, 45·9 per cent.

Judged on the Stockholm figures, radium therapy of the cervix seems to have some advantage over surgery. We must, however, take into account the fact that the results have been obtained by means of a method that continues to be improved, whereas Wertheim's operation has reached a degree of perfection which it will probably not exceed. Patients hardly ever refuse treatment by radium, whereas they are not always willing to undergo operation.

On the other hand, we must not underrate the palliative results obtained in cases where surgery is helpless. In a large number of cases where cure was not permanent, radiotherapy made life bearable for several years by suppressing the alarming symptoms of hæmorrhage and pain. However, it would be premature to decide at present whether quite early epitheliomas of the cervix should be irradiated or operated. Not until several years have elapsed, and we have a sufficiently large number of operable cases treated by radium therapy, will it be possible to choose definitely between the two methods. Border-line and inoperable cases ought, of course, to be treated by radiotherapy.

Influence of Radiation on Other Forms of Cancer.

Radium treatment of cancer of the digestive tract has not given results comparable to those I have outlined above. The epitheliomas of the œsophagus, although radio-sensitive, have up to the present given very bad results on account of the situation of the lesions and the thinness of the œsophageal wall. The introduction of radium tubes into the lumen has not, I believe, resulted in definite recovery in a single case. Our best result—viz., two years' survival—has been secured by transcutaneous irradiation with X rays. It is possible that telecurietherapy may prove useful for this kind of treatment.

Cancers of the stomach and the intestine do not respond well to radium therapy. We have a few interesting inoperable cases improved by rontgen treatment, but here again the time elapsed is too short to warrant a definite opinion. Cancers of the stomach and the intestines are operated upon in the centre as early as possible.

Cancer of the rectum is also very radio-resistant and the results obtained are very unequal. The radio-sensitiveness of these adenocarcinomas is very low, and their destruction often entails lesions of the normal cells which leads to radionecrosis and failure. The method of choice is still surgical operation, and the ingenious method of Neuman and Coryn—the interstitial needling of the rectum wall from the outside after surgical liberation—is only used by us in inoperable cases. This method sometimes succeeds in making cases operable.

We also operate on carcinoma of the breast. For five years past we have been making two parallel series, one including cases of the breast exclusively treated by operation in the general surgical clinic and the other including cancers of the breast operated in the Tumour Centre and radiated after operation by X rays according to Holfelder's method. The technique of operation is exactly the same in both series. The future will show whether or not X rays applied after operation considerably improve surgical results.

To obtain the best possible results from the radium therapy of cancer, certain conditions of research and treatment are indispensable. The technique of radium therapy is not quite so simple as it looks. Anyone can cure with radium a small epithelioma of the skin or an operable cancer of the cervix, but in order to apply proper treatment by radiation to all cases that present themselves and in order to develop and to improve the method, the coöperation of a large number of workers is necessary. In no other branch of medicine is teamwork more indispensable. Cancer work necessitates the organisation of large centres of treatment and research, relatively small in number but generously supplied, not only with large quantities of radium and powerful installations of X ray apparatus, but also with numerous laboratories well fitted out and especially with a competent staff.

The Cancer Campaign in Belgium.

The State has encouraged the creation of centres of treatment and research in the four universities and has endowed each centre with the necessary funds for the equipment of deep therapy and radium departments. An annual subsidy calculated on the number of patients treated is also allowed. For the Brussels Centre the Public Assistance, which has the direction of our hospitals, pays the upkeep of 50 beds reserved for cancer patients in the university hospital. These beds are grouped together in two wards. Each university hires radium from the Union Minière and 50 per cent. of the sums thus collected go back to the centres in aid of the research laboratories. The social work, such as the following-up of patients, is organised for the whole country by the National Cancer League. The university also directs the medical and research organisations. In Brussels the anti-cancer centre is under the direction of the professor of surgery, the professor of pathology, and the professor of radiology. The senior professor of surgery, who is also in charge of the general surgical clinic, delegates his senior assistant to be responsible for the surgical and radio-surgical work. This specialised surgeon will probably be definitely attached to the centre in the near future. The pathologist directs all the histological diagnosis and research work. The professor of radiology is responsible for the rontgen and radium treatment and directs the physical and radio-biological researches. He is assisted by two physicists and a full-time assistant who has specialised in radium therapy and in radio-biological research work. On the staff are also a physician, an assistant bacteriologist, and an assistant biochemist. The urologists and aurists of the hospital are also on the Tumour Centre staff. Consultations take place thrice a week; the surgeon, pathologist, and radiologist all see the patients together and decide in common upon the method of treatment.

This organisation has given good results during the four and a half years it has been in operation. The surgeon and the radiologist have ceased to be sworn enemies and have even conceived a certain respect for each other; mutual and unceasing criticism has prevented us from becoming unilateral, and the two methods—surgical and radiological—instead of being opposed, work very smoothly together. It even happens that the surgeon becomes enthusiastic about radium; and I know that I rely more and more upon my colleague's skill. The physician is one of the most useful members of the team; he is responsible for general medical attendance, a most important part of cancer treatment and one that is too often neglected. He also carries out biochemical treatments for patients who cannot be improved by surgical or radiological means.

Although treatment by radiation is being perfected daily, it is reasonably certain that radium will never cure more than a certain percentage of cancer cases. Research work must therefore continue to seek chemical therapeutics which electively influence the cancer cells, or biological means that increase the resistance of the organism. We shall not be justified in speaking of cure of cancer until we have discovered a substance acting upon metastases as well as upon primary lesions. Unfortunately, we are still far from having reached this ideal. Neither copper, selenium, or magnesium have given really stable and scientifically controlled results, and their application to patients who might still be saved by recognised methods is not justified.

In order to enable the organisation of a centre to do really efficient work, it is imperative that the patients be sent at the first stage of their illness instead of when treatment can only be palliative. All those who have organised cancer centres have had to go through the disappointing period when practically hopeless cases only were committed to their care. Happily, confidence has been slowly growing, and we receive ever-increasing numbers of cancer patients who still have a good chance of being cured. It is, therefore, necessary that the general practitioner should work in close coöperation with the staff of the centres. He has the most delicate task of all, upon which depends the final result—viz., early diagnosis. He must educate his patients and encourage them to be thoroughly examined at the first suspicious symptom; he has to explain the urgency of a biopsy, his rôle is capital and sometimes very difficult. Although a multiplication of centres

of treatment is not always an advantage and has to be limited, on the other hand there will never be too many cancer diagnosis clinics, or, as we call them, "centres de dépistage," where several doctors coöperate and do their utmost to diagnose cancer at an early stage. These dispensaries are in a position to give valuable advice, and can avoid the fatal loss of time that elapses only too often between the first symptom of cancer and its effectual treatment.

THE RESPONSE OBTAINED IN HEALTHY PIGEONS BY THE ADMINISTRATION OF SUBSTANCES EFFECTIVE IN PERNICIOUS ANÆMIA.*

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Recent work on the treatment of anæmia has facilitated the differentiation of a group of human anæmias which must be regarded as due to the deficiency of some substance essential for the normal production of adult red blood cells. Such anæmias, including pernicious anæmia, are characterised by a megaloblastic hyperplasia of the bone-marrow.[1] The bone-marrow of the healthy grain-fed pigeon is also of this type.[2] It appeared, therefore, possible that the administration to pigeons of substances capable of alleviating a deficiency in man associated with megaloblastic hyperplasia of the marrow might provoke a response in the bird similar to that resulting in clinical cases. If such were the case it might provide a biological test for the potency of these substances.

Intravenous administration of a series of relatively pure liver preparations† known to be effective when given intravenously in pernicious anæmia gave a consistent response in 14 healthy birds. Two pigeons only failed to react to a potent fraction. These two negative results were obtained probably because, owing to scarcity of material, it was only possible to give an extremely small dose. The response was characterised by a rapid increase in the circulating reticulocytes, from an average control level of 9·2 per cent. to one of about 18 per cent. This was accompanied by a pronounced gain in the birds' weight when less pure preparations were used. Similar effects were obtained when liver extract No. 343 (N.N.R.) was given by mouth, except when sepsis was present, which is in agreement with clinical observations.

An analysis of the character of this response is given in the Table. It is clear that though the average pigeons for the height or the reticulocyte rise may agree relatively well that there is considerable variation between maximum and minimum figures independent of the dosage. The same variability is found in the date of the initial rise and in the duration of the response.

Hitherto birds from the market have been used whose age and previous conditions of life are unknown. It is clear that in future more completely standardised pigeons must be used if consistent results are to be obtained. Burn[3] has recently pointed out that all methods of biological assay are liable to such variation unless certain mathematical considerations are taken into account and a large series of animals examined.

No such definite responses were obtained when extracts ineffective in pernicious anæmia were employed. Negative results were also obtained with intravenous injections of sodium chloride and histamine, preparations of both fractions of vitamin B (vitamin B_1 (G), B_2 (F), and liver extract No. 343 (N.N.R.)), in which the active principle has been destroyed.[4]

Table showing Character of Reticulocyte Response in Healthy Pigeons Receiving Liver Extracts Effective in Pernicious Anæmia.

No. of pigeons.	Extract.	Dosage.	Reticulocyte response.				
			Max.	Min.	Aver.	Day initial rise.	Duration.
7	132 E	200–25 mg.	20·9	14	18·2	2	6
1	132 EB	25 mg.	16·4	—	16·4	3	5
1	132 ECDB	25 mg.	18·7	—	—	7	11
1	132 ECDB	10 mg.	17·9	—	—	7	Killed 11th day
2	134 ZHB	10 mg.	22·1	21·0	21·2	5–6	Killed 6th day.
10	343 N.N.R.	1–¼ g.	21·1	15·8	17·28	3–8	4–27

Castle[5,6] has shown that beef muscle previously digested by healthy gastric juice is as effective as liver in pernicious anæmia. Human gastric juice fed to pigeons caused no reticulocyte response but beef muscle promptly did so. Probably the pigeon's gastric juice,[7,8] like normal human gastric juice, can elaborate from beef muscle material that promotes blood regeneration.

The positive action of those substances effective in pernicious anæmia upon the bone-marrow of the healthy corn-fed pigeon would appear to be of biological significance. The results recorded in this preliminary report are not consistent enough to allow final conclusions to be drawn as to the possible value of such experiments as a test for the potency of liver extracts.

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FURTHER OBSERVATIONS ON THE ÆTIOLOGICAL RELATIONSHIP OF ACHYLIA GASTRICA TO PERNICIOUS ANÆMIA.*

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Observations have already been reported[1–3] demonstrating that by an interaction of normal human fasting gastric contents and beef muscle, both of which are separately ineffective, a substance is produced which will cause a prompt hæmatopoietic effect and clinical improvement in Addisonian pernicious anæmia

* Read at the meeting of the American Society for Clinical Investigation at Atlantic City on May 5th.

† We are greatly indebted to Dr. Edwin J. Cohn and Dr. Thomas L. McMeekin, of the Department of Physical Chemistry of the Harvard Medical School, who made the liver preparations and supplied them for our experiments. The clinical tests were made on patients under the care of Dr. George R. Minot, who provided necessary information as regards the potency of the different preparations.

* Read at the meeting of the American Society for Clinical Investigation at Atlantic City on May 5th.

comparable to that obtained with liver feeding. The nature of this reaction has now been studied by means of observations upon 15 additional cases of pernicious anæmia in respect to the nature of (1) the extrinsic factor of the reaction contained in beef muscle, and (2) the intrinsic factor present in normal human gastric contents.

These observations demonstrate that the proteins precipitated at pH 6 from beef muscle may act as the extrinsic factor. Normal human saliva, and duodenal contents collected by a special technique so as to be free from gastric juice, are entirely ineffective when incubated with beef muscle. Hence, by elimination, the intrinsic factor appears to be secreted by the normal gastric mucosa, as was originally supposed from a consideration of the essential pathological physiology of the pernicious anæmia patient. Further observations have demonstrated that the essential reaction between gastric juice and beef muscle may take place in neutral solution, that heating the gastric juice to 40° C. for three days or to from 70° to 80° C. for one half hour will abolish its effectiveness. If normal gastric juice is treated with casein solution [4] and then with magnesium carbonate,[5] the pepsin and rennin may be completely removed, leaving behind an unknown factor which, however, can react in neutral solution with beef muscle to produce the hæmatopoietic substance. The gastric juice of two patients with blood pictures entirely consistent with the diagnosis of pernicious anæmia (sprue and multiple intestinal anastomosis), both of which subsequently showed a typical response to effective liver extracts, has been found in each case to contain normal amounts of hydrochloric acid, pepsin, and rennin but to be entirely incapable of reacting with beef muscle. The irrelevance of any of the existing tests of gastric function for the detection of the essential factor of the normal gastric juice is thus made clear. Although the nature of the extrinsic factor of the essential reaction is demonstrated to be in all probability protein or a closely related substance, the nature of the intrinsic factor contained in the normal gastric juice remains unknown. However, it is certainly not hydrochloric acid, pepsin, or rennin. It may act in neutral solution and is destroyed by heating as above described.

In contrast to our original negative experiments with pig stomach mucosa after autolysis in acid,[6] it has now been found possible to reproduce the activity of 300 g. of fresh pig stomach mucosa by incubating 25 or 100 g. of this material with 200 g. of beef muscle. These experiments suggest that the effectiveness of pig stomach feeding demonstrated by Sturgis and his associates after our original negative results with autolysed mucosa [7] is the result of post-mortem changes within the tissue similar to physiological reactions occurring between normal human gastric juice and beef muscle. The activity of the pig stomach is furthermore apparently not identical with that of liver since heating the former to 100° C. for five minutes is sufficient to markedly diminish its potency in contrast to the lack of effect on liver extract under similar circumstances.

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ROYAL WEST SUSSEX HOSPITAL.—The feature of the annual meeting on April 8th of the governors of this large hospital at Chichester was the record of the success of the contributory fund which was founded in 1926. The year 1925 closed with a debt on the 12 months' working of the hospital of £2758. Since then in successive years the deficit has fallen to £2639, £1976, £649 and £525, respectively. The contributory fund in its first year produced £178, but last year £2523; and it is estimated that it will provide at least £3000 in the current year.

VITAMIN A AND STREPTOCOCCAL ANTITOXIC IMMUNITY.

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INVESTIGATIONS into the immunity produced in patients after attacks of scarlet fever and diphtheria have shown that a number do not become immune. Such lack of immunity has been investigated by us in connexion with relapses in convalescents.[1] The reason for the failure to develop immunity is obscure. We have suggested elsewhere[2] that it is possibly due, in some instances, to hereditary lack of antibody-producing capacity. Other possible explanations are that there has been an insufficient stimulus to the antibody-producing mechanism or that substances which are necessary for the production of antibodies have been deficient. Vitamin A has been considered an important anti-infective substance, the lack of which predisposes to infections. Whether such deficiency causes lack of sufficient stimulus or whether vitamin A is essential for the production of antibodies and the deficiency of it deprives the cells of a substance which is essential to antitoxin production is not known. The term "anti-infective" was applied to vitamin A in a report based on experimental work in animals by Green and E. Mellanby[3] (1928) who repeated the experiments of previous workers, with the result that their animals fed on a diet deficient in vitamin A died, and post-mortem examination showed the presence of various infective lesions. It has been suggested that infection is associated with a metaplasia of epithelial cells due to vitamin A deficiency. In a further investigation E. Mellanby and Green[4] (1929) undertook a preliminary exploration of the specific action of vitamin A in human infection. They studied the prophylactic and curative effect of vitamin A on pregnant women and in cases of puerperal septicæmia. It is obvious that many pregnant women take a diet inadequate in vitamins, and it would therefore be conceivable that if vitamin A is anti-infective in action these women would be more susceptible to sepsis during the puerperium. Mellanby now reports [5] the complete recovery of eight out of nine cases of puerperal streptococcal septicæmia treated with preparations containing vitamin A. Mellanby and Green had previously suggested [4] that if it is proved to have anti-infective qualities of a curative nature, it must also be of inestimable value in prophylaxis. This form of prophylaxis is too costly, however, to undertake unless some definite results are to be achieved. Mellanby states that the effect of the vitamin was apparently rather to increase gradually the general resistance than to act suddenly, as might be expected in the case of a substance having a specific bactericidal or antitoxic effect, although he also says that he believes that vitamin A plays a part as an anti-infective agent to bacterial infection and has the property of raising the resistance of the body to such infection.

It is difficult, a priori, to see on what grounds it can be held that the ingestion of a vitamin or any food factor can effect a prophylactic action without the stimulus provided by a specific toxin. The conclusion of G. Ramon[6] (1929) was that no production of antitoxin occurs independently of the presence of antigen, specific antitoxin depending upon a chemical nucleus derived from the antigen.

We decided to investigate the prophylactic effect of vitamin A on the antitoxic immunity as demonstrated by the Dick tests in (*a*) a group of pregnant women attending the antenatal clinic, who presumably had no stimulus provided by a specific antigen; (*b*) in patients suffering from scarlet fever who had,

of course, such a stimulus. The preparation of vitamin A which we employed was Radiostoleum, ℥ vi. in capsules. In group (*a*) 221 pregnant women attending the Ilford antenatal clinic were Dick tested. Those who were Dick-positive were ordered radiostoleum in capsules by the mouth three times a day. They were re-tested at monthly intervals until labour occurred, or until the Dick reaction became negative. Mellanby appears to believe that a fortnight's administration of the vitamin would produce an effect in a case of puerperal septicæmia; consequently it would appear that the length of administration in our cases should have been ample to have produced a result. Table I. shows the results of this procedure.

TABLE I.—*Ilford Maternity Home (Antenatal Clinic). Period August 24th to Dec. 2nd, 1929.*

Radiostoleum and Dick Tests.

Result.	Individual cases treated.
Negative	153
Positive (test not repeated)	16
„ (repeated tests)	36
„ turned negative	16
Total cases tested	221
Total positive at first test	68 cases.
Percentage positive at first test	30·7
Repeated monthly tests in 52 cases—	
Percentage of cases turned from positive to negative	30·7
13 of the 16 cases which turned negative, remained negative on repeated tests	25 per cent. of the total positives.
36 cases who were positive at initial test were re-tested at monthly intervals and remained positive.	
Re-tested twice	12 cases.
„ three times	14 „
„ four times	10 „
Total	36 „
All these cases were taking radiostoleum by the mouth ℥ vi. in capsules t.d.s.	
In six of the cases the radiostoleum was not taken quite consecutively.	
16 cases who were positive at the initial test became negative on re-testing; of these 13 remained negative—	
Re-tested as follows—	
Once	6 cases.
Twice	6 „
Three times	1 case.
Total	13 cases.
Three cases were positive at the initial test, became negative at the re-test and returned to positive on further re-testing (two of these cases were re-tested one week after giving a negative test) and remained positive two months later.	

It will be noted that the percentage (30·7) of initial positive results compares with those of Burt-White (27)[7] and Weiss (39)[8]; Kunz and Nobel[9] only found 11·8 per cent. positive (in predominantly city patients). The turnover from positive to negative may be due possibly either (1) to the development of antitoxin in response to an antigen which was latent (a few of the 16 cases developed such conditions as tonsillitis, rhinitis, or influenza; the majority, however, were quite well), this may possibly have been accelerated by the administration of toxin in the Dick test; (2) to changes in the body mechanism due to such causes as change of tonus of the vegetative nervous system and shifting of the hydrogen-ion concentration, as suggested by von Groer[10]; (3) to some specific action of the vitamin A, either with or without a latent antigen stimulus; (4) to a natural variation in streptococcal immunity, people not being persistently immune or susceptible; or (5) to the Dick test not being an accurate estimate of antitoxin immunity.

Table II. shows that the size of Dick reaction varied with the tendency to change over to negative.

No cases with a very large Dick-positive result became negative, and the majority of the cases which became negative were the minimal Dick-positive results. This suggests the possibility that the cases which became Dick-negative were already undergoing a process of latent immunisation. The fact that the administration of vitamin A in 36 cases had not the slightest effect is sufficient demonstration that this vitamin, as with other non-specific substances, cannot cause an appearance de novo of antitoxin.

TABLE II.—*Relationship between Size of the Dick Reaction and Tendency to Turn Negative.*

Cases.	Size of reaction.			
	10–20 mm.	21–30 mm.	31–40 mm.	Over 40 mm.
Repeated positive (36 cases)—				
Largest reaction	1	7	17	11
Cases which turned negative (16)	10	5	1	0

The work of Weiss,[8] who tested patients in pregnancy and during the puerperium, showed that of 100 cases tested, 11 became Dick-negative, while nine which had been Dick-negative in pregnancy became positive during the puerperium. Weiss suggested that there was a variability of the reactions caused by the process of childbirth, but not of any definite direction of the changes. This would appear to give added support to No. 4 of the possibilities enumerated above, and it is quite possible that if we had Dick tested the whole of our cases monthly, we should have found that some of the Dick-negative cases became Dick-positive. In our own series three cases which became Dick-negative subsequently returned to their original Dick-positive condition. We have observed this in convalescent scarlet fever patients both in those treated and those not treated with vitamin.

Burt-White,[11] Colebrook and others performed the Dick test in 26 cases before and after labour, and in one case there was a change from positive to negative result, the puerperium being afebrile. As, however, only one test appears to have been applied to each patient before labour, too much stress cannot be laid on these results.

In order to test the effect of administration of vitamin A in persons who had a streptococcal antigen stimulus, we administered the vitamin to cases of scarlet fever in the Ilford Isolation Hospital. The radiostoleum was given three times a day in capsules of ℥ vi. to 64 cases of scarlet fever, out of a consecutive series of 117 cases admitted during the period August to November, 1929. Dick tests were performed on all cases at weekly intervals; 47 patients received radiostoleum from the day after admission, and 17 began it during convalescence (Table III.).

TABLE III.—*Result of Dick Test in 64 Cases of Scarlet Fever to whom Radiostoleum was Given.*

Repeated Dick tests in convalescence.	On discharge.	No. of cases.
Negative	Negative	20
Positive	„	22 (*a*)
„	Positive	14 (*b*)
Variable	„	8 (*c*)

(*a*) In ten cases radiostoleum was started in convalescence.
(*b*) In four cases radiostoleum was given only one week before final test.
(*c*) In three cases radiostoleum was started in convalescence.

Percentage of these cases which were negative on discharge	65·6
Percentage of these cases which were positive on discharge	34·4

Results of Dick tests in 53 cases of scarlet fever to whom no radiostoleum was given:—

Dick-negative during convalescence	40
„ becoming positive	13

Of the whole consecutive series of 117 cases
70 per cent. of cases were negative on discharge from hospital.
30 per cent. of cases were positive on discharge from hospital.

It is obvious that the figures just given are not of value unless compared with a consecutive control series of cases; this is given in Table IV.

TABLE IV.—(*Control*). *Results of Weekly Dick Tests in 107 cases of Scarlet Fever, admitted to the Ilford Isolation Hospital, December, 1927–May, 1928.*

Weekly Dick tests in convalescence.	On discharge.	No. of cases.
Negative	Negative	36
Positive	,,	29
,,	Positive	11
Variable	,,	31

60·7 per cent. of cases were negative on discharge.
39·3 ,, ,, ,, positive ,,

Whereas 34·4 per cent. of the cases to whom vitamin A was given were Dick-positive on discharge from hospital, 39·3 per cent. of cases in the control series were positive. The difference of 5 per cent. cannot be held to show that any material effect is produced by the administration of vitamin A. We believe that the small difference was due to such factors as the infecting type of streptococcus and the individual power of developing immunity. We conclude that there was no difference in the production of antitoxin in the cases which received vitamin A and those to whom it was not administered.

We further investigated the case of a child who was still Dick-positive after an attack of scarlet fever, a relapse of scarlet fever and two successive immunisations against scarlet fever with toxin. She was treated for a month with radiostoleum ℿ vi. three times a day, and at the end of that period was Dick tested, and was then found to be still Dick-positive, the reaction being 39 × 27 mm., the control being negative.

Puerperal Cases.

Joe[12] found that of 22 cases of puerperal sepsis due to hæmolytic streptococci, 15 were Dick-negative and seven were Dick-positive. He argues from this that invasion by the hæmolytic streptococcus is apparently not restricted to the Dick-positive cases, and that an antitoxic immunity is no barrier to a general infection of the blood stream, since three cases of septicæmia and one of pyæmia were all Dick-negative. These results, however, may not altogether bear this implication as it is not stated at what date in the infection the Dick test was performed. A number of cases of scarlet fever are Dick-negative when the attack has started, but this is no evidence that they would not have been Dick-positive if they had been tested a little time before the actual date of the attack, and as the date of the Dick test before death is not given, the conclusion of Joe, that an antitoxic immunity is no barrier to a general infection of the blood stream, does not seem to be clearly substantiated, as the general infection of the blood stream possibly occurred before the Dick test became negative. The work of Burt-White suggests strongly that there is a correlation between Dick-sensitiveness and streptococcal infection.

We were able to follow up 92 cases of our series at the maternity home. Puerperal pyrexia occurred in six, three of whom were Dick-negative and three Dick-positive. The only case, however, which was at all probably of streptococcal origin and was a case of an acute pyosalpinx, was Dick-positive at the first test and remained Dick-positive in spite of treatment with radiostoleum.

We have also seen one case in which the administration of the vitamin appeared to have a definite effect. The following is an account of this case:—

A primipara, aged 23 years, delivered at home without instruments, had a normal labour; abdominal pain commenced on the second day, offensive lochia appeared on the third day, and rigors and vomiting began on the fifth day. She was admitted to the cubicle pavilion of the Ilford Isolation Hospital on the sixth day after labour with a temperature of 101·6° F., a pulse-rate of 84, and a respiration-rate of 18. She was flushed and anxious, and her abdomen was distended, tender, and quite resonant; some resistance was present below the umbilicus. The cervix and vagina were not lacerated, the uterus was not abnormally large, and there was no tenderness at the fornices. The lochia were slight and hæmorrhagic. She had an ulcer on a finger of the left hand, due to a whitlow which had been opened on the third day after labour; *Staphylococcus aureus* was found on culture from the cervix and the finger, but the blood culture was sterile. The urine contained no organisms or pus cells. She was given 60 c.cm. of antiscarlatinal serum and intra-uterine glycerin injections. Tenderness became most marked over the right side of the abdomen which was resistant to palpation. On the tenth day after labour the temperature was 102·8° F., the pulse-rate 108, and the respiration-rate 30; free fluid was diagnosed in the abdomen and laparotomy was performed by Dr. Everard Williams. Foul-smelling pus was found in the right paracolic gutter and Morrison's pouch; culture of this pus showed streptococci and *B. coli*. Two drainage-tubes were inserted. The patient ran an intermittent temperature until the fifteenth day after the operation when the temperature was 102·4° F. On the sixteenth day radiostoleum (liquid a drachm twice daily) was commenced. On the twentieth day the temperature was normal and she was doing well. On the thirtieth day the tube from the central incision was left out. The patient vomited on the next day, her temperature rose, and the abdominal condition suggested retained pus; the tube was replaced and the temperature became normal within 12 hours. The patient was discharged from hospital five weeks later with a small central sinus, and sent away for convalescence.

Obviously it cannot be claimed that the administration for four days of radiostoleum two weeks after the operation could be the cause of the recovery of this case.

We are inclined to think that in our own case, and possibly in some of those described by Mellanby, the improvement effected by the administration of the vitamin was a coincidence. The difficulty of deciding on the effect of any particular treatment in puerperal septicæmia is well shown in the recent work by Burt-White[13] on the treatment of puerperal septicæmia by concentrated scarlatinal antitoxin, where he reported 27 cases treated with eight deaths; after that he treated three cases with the same serum, all of which proved fatal.

We have come to the conclusion that there is no evidence at present that the administration of vitamin A in pregnancy has any effect in increasing the resistance of the body to streptococcal infection. Whether or not it has any effect in raising the general resistance is unknown and impossible to determine. The term "general resistance" is a loose one and we have no evidence that, if a person is not actually immune to a specific infection, any "general resistance" will prevent him from contracting that infection.

Results and Conclusions.

Vitamin A, in the form of radiostoleum, was administered to 52 women during pregnancy; in 16 women the Dick reaction turned from positive to negative; in three of these, however, it again reverted to positive. Sixty-four cases of scarlet fever were given radiostoleum, but the Dick reaction in convalescence was not considered to show any marked alteration from that in a control series of 107 cases. A child who had had scarlet fever and a relapse and two courses of inoculations with toxin against scarlet-fever and was still Dick-positive, remained Dick-positive after a course of radiostoleum for one month.

The results which we have obtained suggest that there is no prophylactic value in administering vitamin A in pregnancy to prevent the development of puerperal fever; also that it is doubtful whether the effects which have been described as following its administration for the purpose of treatment are not a coincidence. The conclusions based on experimental evidence of other workers have recorded that a deficiency of vitamin A in the diet predisposes to changes in the epithelial linings of mucous tracts in animals and, therefore, allows infections to occur.[14] This does not, in our opinion, justify a belief that the adequate supply of such vitamin would, in the presence

of a sufficient infective dose and the absence of immunity, prevent the occurrence of infection.

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THE DICK TEST IN RELATION TO INCIDENCE OF PUERPERAL INFECTIONS.

REPORT ON FIVE HUNDRED CASES AT ST. MARY'S HOSPITAL, MANCHESTER.

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THE success of the Dick test in distinguishing those who are immune or susceptible to scarlet fever, and the prevalence of infection with the *Streptococcus hæmolyticus* in the puerperium has led recently to several investigations on the relation of the Dick test to the incidence of puerperal sepsis (Burt-White, 1928,[1] amplified by Burt-White, Colebrook, Morgan, Jervis, and Harre, 1930[2]; Salmond and Turner, 1929.[3]

Burt-White showed that 30 per cent. of 27 Dick-positive cases became febrile in the puerperium compared with 2 per cent. of 73 Dick-negative cases. In Salmond and Turner's results 20 per cent. of 158 Dick-positive and 15 per cent. of 373 Dick-negative cases developed fever, and Burt-White, Colebrook, Morgan, Jervis, and Harre found 6·9 per cent. of 230 Dick-positive and 4·9 per cent. of 770 Dick-negative cases to become febrile.

The present investigation comprises a study of 500 women with the object of determining the relation between the results of the Dick test and the character of the puerperium. Of these, 248 were tested in the last week of pregnancy, 152 during labour, and 100 within 24 hours of delivery. In considering the results no distinction has been made between these groups; the percentage of Dick-positive and Dick-negative cases in each group was approximately the same; of the cases tested before or during labour, 28·5 per cent. were Dick-positive; of those tested within 24 hours of delivery, 26 per cent. were Dick-positive.

Method.

The toxin used for the Dick test was prepared from cultures of the Dochez strain of scarlatinal origin grown in Hartley broth for 44 hours. The reaction was adjusted to pH 7·6 before filtration. One batch of toxin has been used throughout the investigation. It was stored in a 1 in 10 dilution at ±5° C.; further dilutions were made every four days. This toxin produced good reactions in a dilution of 1 in 10,000. A dilution of 1 in 1000 produced slightly bigger reactions than the toxin issued by Messrs. Burroughs Wellcome and Co. for the Dick test; 0·2 c.cm. of a 1 in 1000 dilution was the amount of toxin used in the test. A control injection of Hartley broth 1 in 1000 was always made. All readings were taken between 20–24 hours after the injection and a reaction was considered positive if an area of erythema 1 cm. or more in diameter developed.

The standard of morbidity adopted was that formed by the B.M.A.: "all fatal cases and all cases in which the temperature reaches 100° F. on any two of the bi-daily readings from the end of the first day to the end of the eighth day after delivery." For the purpose of this investigation an attempt was made to subdivide the morbid cases into three grades according to severity. The first grade included all the cases which just came within the minimal requirements of the standard. The second grade included all cases with a temperature of 100° F. or over sustained for 48 hours with perhaps an occasional rise during the remainder of the puerperium; in these cases the pulse was increased in proportion to the rise of temperature, involution was retarded, and invariably the lochia was foul-smelling; headache was constantly present. These were cases which might be termed moderate sepsis. The third grade contained all cases of "septicæmia" and cases with persistent or intermittent fever lasting more than 48 hours; constitutional symptoms were severe and the lochia scanty.

Relation of Dick Test to Incidence and Degree of Morbidity.

The information under this heading is shown in Table I.

TABLE I.

—	Cases tested.	Cases morbid.	Percentage morbid.	Degrees of morbidity in cases in grades—		
				I.	II.	III.
Dick-positive.	140	14	10	8	2	4 (1 death)
Dick-negative.	360	46	12·8	21	20	5 (2 deaths)
Total ..	500	60	12	29	22	9

In this series, 28 per cent. (140 cases) were Dick-positive; 72 per cent. (360 cases) were Dick-negative. This corresponds to the figures obtained by others (Burt-White 27 per cent. positive; Salmond and Turner 29·6 per cent. positive; and Burt-White, Colebrook, Morgan, Jervis, and Harre 29·2 per cent. positive). The incidence of morbidity was 12 per cent. This is greater than in the series reported by Burt-White, Colebrook, Morgan, Jervis, and Harre, whose morbidity-rate was only 5·4 per cent., but it is approximately the same as the results shown by the other investigators. This difference may be accounted for by the adoption of the B.M.A. standard for this series, which would include cases omitted in the series quoted above.

In the Dick-positive group the incidence of morbidity was 10 per cent. as compared with 12·8 per cent. in the Dick-negative group. This difference (2·8 per cent.) is not significant as it is less than the standard error (6·1). Comparing the Dick-positive and Dick-negative groups as to the incidence of morbidity of each grade, it has been found that the observed differences are not significant when the standard error of sampling is taken into account. The observed difference in grade I. was 11·5 per cent. (standard error 15·1). In grade II. the difference was 29·1 per cent. (standard error 11·8). In grade III. the difference was 17·8 per cent. (standard error 12·7). There is thus no indication that immunity to toxin as judged by the Dick test decreased the liability to puerperal infection. The total number of severe infections was small, and the percentage incidence does not fall outside the limit of the standard error and must be attributed to chance sampling. That most of the severe infections in the Dick-negative group were associated with hæmolytic streptococci will be shown in discussing the bacteriological findings.

Incidence of Morbidity in Relation to Interference.

Interference and the unavoidable trauma which accompanies it must always be considered an important factor in the subsequent infection in the

puerperium. Young [4] (1928), in an address on maternal mortality from puerperal sepsis, discusses the factors which lead to infection during labour and the puerperium and gives evidence that trauma is the most important cause of the death-rate from sepsis.

In this series a comparison has been made between cases which were delivered spontaneously and those which had some form of major interference. By interference is meant any form of instrumentation, manual removal of the placenta, or induction other than medicinal. It is, of course, probable that factors other than the actual manipulation—e.g., prolonged labour, hæmorrhage, &c.—which are usually associated with the type of case requiring interference, were partly responsible for the morbidity recorded. The results are shown in Table II.

TABLE II.—*Relation of Interference to the Incidence of Morbidity.*

—	Interference.			No interference.		
	Cases.	Morbid.	Standard error.	Cases.	Morbid.	Standard error.
		%	%		%	%
Dick-positive ..	41	7 (17)	±5.86	99	7 (7·0)	±2·6
Dick-negative ..	118	28 (23·7)	±3·9	242	18 (7·4)	±1·7
Totals ..	159	35 (22·0)	±3·3	341	25 (7·3)	±1·4

The total morbidity is 22 per cent. with interference as compared with 7·3 per cent. without interference. This difference (14·7 per cent.) is about four times the standard error (3·57) and is, therefore, significant. In the non-interference group there is no significant difference in the incidence of morbid cases among those who were Dick-positive or Dick-negative, the observed difference (0·4 per cent.) being less than the standard error (3·07). In the interference group the observed difference in morbidity between the Dick-positive and Dick-negative cases is 6·7 per cent., the standard error being 7·05. Thus there is no evidence that the observed differences between Dick-positive and Dick-negative cases occurred otherwise than as chance variation. Under the circumstances in which the liability to infection was greatest (interference) it will be seen that immunity to toxin did not tend to reduce the incidence of morbidity.

Seven of nine cases which had the most severe grade of infection (Table I.) had been subjected to interference.

Bacteriological Examination.

Whenever possible severe cases of infection were examined bacteriologically. Material was taken from the uterus by means of a guarded swab introduced into the cervix uteri under aseptic precautions. Blood cultures were made and the urine examined in selected cases.

Method.—Anaerobic and aerobic cultures were always made. The hæmolytic streptococcus was identified after 24 hours incubation on horse-blood agar plates by a zone of hæmolysis of 1–2 mm. surrounding the colony. A summary of the bacteriological findings in eight cases (six of which were Dick-negative) is given in Table III. In all, the infection was concluded to be of genital origin except in case 196, where the severity of the illness was due to *B. coli* infection of the urinary tract, and case 349, which developed pulmonary tuberculosis. Six out of eight cases showed mixed cultures; from six Dick-negative cases the hæmolytic streptococcus was isolated from the uterus in four and present in the blood of the fifth, but in only one instance was it in pure culture. *B. welchii* was present in two mixed cultures.

Examination of the Lochia.—The lochia of 15 cases of moderate sepsis (grade II.) was examined, 14 of which were from Dick-negative cases. In four the hæmolytic streptococcus was the predominating organism; hæmolytic *Staphylococcus aureus* predominated in six; diphtheroids in two; *B. coli* in one; and non-hæmolytic *Staphylococcus albus* in two. Hæmolytic streptococci were not isolated from the Dick-positive case.

TABLE III.—*Summary of Bacteriological Findings.*

In each case, what appeared to be the predominating organisms is stated first.

Case.	Degree of morbidity	Uterine culture.	Blood culture.	Result
DICK-POSITIVE CASES.				
250	III.	No growth.*	Sterile.	R.
349	III.	Mixed actinomyces † pseudo-necrophorus; non-hm. staph.	,,	R‡
DICK-NEGATIVE CASES.				
134	II.	Mixed hm. strept., *B. coli.*	Sterile.	R.
151	III.	Non-hm. staph.; mixed hm. strept., *B. coli*, *B. welchii.*	Hm. strept.	D.
155	III.	Non-hm. staph.; mixed strep. viridans, *B. welchii.*	Sterile.	R§.
196	III.	Hm. staph.; mixed *B. coli*, aerobic spore-bearing organism.	Hm. strept. just before death.	D.
299	III.	Pure hm. strept.	Hm. strept.	R.
450	III.	Mixed hm. strept., non-hm. staph.	Sterile.	R.

* Direct film showed a few Gram-positive diplococci.
† This organism closely resembles the one described by Harris and Brown [5] (1927).
‡ Tuberculosis diagnosed three months later.
§ *B. coli* cystitis.
Hm. = hæmolytic; Staph. = *Staphylococcus aureus*; Strept. = streptococcus; R = recovery; D = death.

Discussion and Summary.

The results of this investigation show that immunity to streptococcal toxin measured by the Dick test did not decrease the liability to a morbid puerperium. In a series of 500 cases the standard error of sampling is necessarily high and before making a final conclusion a much larger series would have to be investigated, but if the results of other workers on this subject are considered with the present ones it is justifiable to state that the Dick test is not a reliable method of indicating a susceptibility or otherwise to puerperal infections.

There were in all only nine severe infections in this series. Of these, five which were Dick-negative were examined bacteriologically; four were infected with *Streptococcus hæmolyticus*, and two died. It is evident that immunity to toxin as judged by the Dick test did not prevent streptococcus infection. Moderate cases of sepsis may occur as frequently in those who are immune to streptococcal toxin (Dick-negative) as those who are susceptible (Dick-positive). This fact may depend on the infrequency of hæmolytic streptococcal infections in this type of case. Colebrook (1929) and Colebrook and Harre (1930) found 7 and 7·6 per cent. of their milder cases to be due to this organism. Armstrong and Burt-White (1929) found a higher incidence (23 per cent.).[6] Infection was significantly greater (four times the standard error) in cases which had been subjected to interference. In the majority of cases of sepsis there was a mixed infection locally, but in those which gave a positive blood culture the hæmolytic streptococcus was isolated in each instance. Local infections may be aggravated by the presence of anaerobes; in two out of eight cases *B. welchii* was isolated from uterine cultures.

The failure of antitoxic immunity as indicated by the skin test to prevent streptococcal infections may result from several possible factors. Trauma and mixed infections may aid the invasion of streptococci. It is possible that some strains have a high invasive power which antitoxic immunity does not hold in check. The question of the identity of toxins from strains of different sources may still

be open to doubt, and even if they are identical the toxin which produces a skin reaction may not necessarily be the only toxin responsible for pathogenic effects.

I wish to express my thanks to the medical board of St. Mary's Hospital for permission to utilise their cases and to the resident medical and nursing staff for their help in this work. I am much indebted to Prof. H. B. Maitland for his useful criticism and advice and to Dr. E. H. Scholefield for his valuable help in interpreting the tables.

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Clinical and Laboratory Notes.

A NOTE ON MARGINAL OSTEOMYELITIS OF THE JAW.

By J. Dunlop Kidd, *M.C.*, M.B. Glasg., D.M.R.E. Camb.

Osteomyelitis of the upper or lower jaw has, of course, been recognised for a long time, but it has usually been of a diffuse type involving large areas of bone. There is another type, however, which is not so well known, nor have I been able to find any exact description of it in the most recent books dealing with dental pathology. It is not a condition that spreads far from the alveolar margin, and I should like to call it "marginal osteomyelitis." I do not think an accurate diagnosis is possible without an X ray examination. I have only seen about half a dozen cases in a scrutiny of the dental radiograms of some 2000 patients.

Marginal osteomyelitis is a definite sequela of pyorrhœa, and the infection starts from the sockets of septic teeth. Usually, after the extraction of even the most septic teeth, the socket drains freely and regeneration takes place at a fairly early date, the socket being filled in with new alveolar bone. This process can be checked by a series of radiograms. If there is not free drainage, or if some septic focus is left behind and shut off, then marginal osteomyelitis may follow; but this may not supervene till weeks or months after the extractions have taken place.

Intra-oral dental radiograms[1] of the affected area show in the early stage that the sockets of the extracted teeth are patent, that there is no sign of regeneration, and that the inter-radicular processes remain distinct. Later films show more definite bone changes, all, or only some of which, may be seen on the same film. The first is the increased translucency of the alveolar bone; next, the margin becomes feathery, worm-eaten and irregular, small detached sequestra being seen. Then small areas of absorption, rather like small cysts, appear either close to the margin or at varying distances from it. Here and there a little bone sclerosis may be evident, and in one case definite new periosteal bone was seen, practically the same as is seen in a periosteal sarcoma.

The area infected does not tend to spread much laterally, but is confined to the areas from which pyorrhœally infected teeth have been extracted. Bacteriological investigation yields a streptococcal growth, usually in pure culture. Judging from the cases I have been able to trace, the systemic effects of marginal osteomyelitis are the same as from pyorrhœa or peri-apical tooth abscesses, but more virulent, as might be expected. When the medical attendant of a patient suspects dental infection as the cause of some morbid condition, he naturally asks that an X ray examination may be made of the teeth. This may show no dental sepsis; but how often are the edentulous areas also examined? Probably very seldom, unless the dentist suspects a broken stump, the supposition being that if there are no teeth there can be no dental sepsis. In my opinion, a complete radiographic examination of the mouth should include the edentulous areas as well as the standing teeth.

Notes on Four Cases.

(1) Male, aged 53. Severe pyorrhœa—all teeth extracted eight years ago—septicæmia with infection of right knee-joint, which is now stiff. X ray of upper and lower alveolar margins showed marked osteomyelitis in canine and central areas. Pure streptococcus growth from these areas—extensive local curetting; right antrum also infected; vaccine treatment gave marked improvement.

(2) Male, aged 60. Anæmic and toxic—"an ill man"; upper left premolar to right canine areas were edentulous and showed marginal osteomyelitis on X ray examination; pure streptococcus obtained; vaccine and local treatment given with great improvement in condition.

(3) Male, aged 60. Pale, anæmic, and toxic—gastric symptoms; upper left and lower right molar and premolar areas. X rays showed marginal osteomyelitis and periosteal new bone; pure streptococcus obtained; vaccine treatment given; great improvement.

(4) Female, aged 42. Severe pyorrhœa—teeth extracted some years ago; anæmia and general malaise, practically an invalid; upper and lower right premolar and canine areas showed marginal osteomyelitis; recurrent exacerbation of general symptoms every four or five months; patient in bed; prolonged vaccine treatment with recovery.

[1] The radiograms illustrating this note have been omitted owing to the loss of detail on reproduction.

TREATMENT OF GENERAL PARALYSIS OF THE INSANE BY INJECTION OF SULPHUR.

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Schroeder,[1] in a paper published in November, 1929, records the therapeutic effect of injections of sulfosin. Much of what he claims I should like to confirm in this brief report, which I intend as a prelude to a fuller account. There are two important points which make the method worthy of full investigation. (1) It is generally agreed that the earlier malarial or other forms of "pyrexial" therapy are begun in cases of general paralysis of the insane the greater is the chance of recovery. Up to the present time, however, hardly any cases are treated outside hospitals or nursing homes, so far as I know, because of the difficulties involved. Hence many cases have been left to degenerate until they were certifiable, when the chance of successful treatment was much less. (2) It is also common experience that some cases entirely fail to react to malarial inoculation, while cases that have been successfully inoculated and yet do not improve cannot, as a rule, be successfully reinoculated within six to nine months.

If, therefore, it can be shown that the treatment of general paralysis by injections of sulphur in olive oil is as effective as malarial therapy, it places a valuable new method of treatment in the hands of the practitioner situated even in the most remote district, for the technique is simple and the substance is easy to handle. Moreover, it forms a second mode of attack should malarial therapy fail.

At present there are two preparations on the market—collosol sulphur and sulfosin Leo.[2] The latter is the preparation used by Schroeder in his work,

[1] Schroeder, Knud: The Lancet, 1929, ii., 1081.

[2] Collosol sulphur is obtainable from British Colloids, Ltd., 22, Chenies-street, London W.C.1, and sulfosin Leo from C. L. Bencard, Ltd., 143A, Wardour-street, W.1.

and is put up in boxes containing phials of 1 c.cm., 5 c.cm., and 10 c.cm., also in boxes containing ten phials of 10 c.cm. Collosol sulphur is put up in phials of 1 c.cm. and 5 c.cm., or in sterile bottles containing 1 oz. I have been using both these preparations in order to contrast the efficacy.

The technique I have followed is precisely that of Schroeder. 1 c.cm. of the preparation is injected intramuscularly into the outer side of the thigh. Unlike Schroeder, we find it better to make the injection at about 7 P.M. in order to simplify the nursing, for then the most important half-hourly temperatures are taken in the morning rather than during the night. After the injections the temperature is taken every two hours until pyrexia commences, when the temperature is charted every half hour until it is normal again, then the two-hourly charting is resumed. The temperature in my cases has usually fallen to normal in about 10 to 14 hours, although there is frequently a secondary smaller rise which, however, soon subsides. After the temperature has been down to normal for some hours the next injection can be given and the dose increased by 1 c.cm. unless the previous temperature has been much over 104° F. This is continued until ten injections have been given.

I do not altogether agree with Schroeder that the degree of pyrexia can be regulated by the dosage. The data so far at my disposal tend to suggest that a high degree of fever can be maintained without increasing the dose in some patients, while in others an increase of several c.cm. may not produce a relatively larger increase in fever. I think that each individual has probably to be studied in this connexion.

The injections have caused more discomfort in my cases than Schroeder suggests, and one patient had marked inflammation and œdema down the leg, but the pain seems to disappear rapidly, without ill-effects. It is too early to compare the clinical results of the two preparations used, but they both produce excellent pyrexia.

The material on which I base this report is as follows: The treatment was begun on Dec. 11th, 1929, and a total of 14 cases have been treated with a series of ten injections, while one other is under treatment. In all but one temperatures ranging from 101° to 105° F. were produced by each injection. The case which showed only a slight pyrexia after each injection had been twice previously inoculated with malaria, once by mosquitoes and once by blood, but on each occasion without any successful reaction. He was in extremis when the injections of sulphur were started and died subsequently. At autopsy it is interesting to note that besides the changes common to general paralysis a stone of over 4 oz. was found in the remains of the left kidney, which had been reduced to a fibrous sac, while the right kidney was also partially destroyed by another stone. Another of the patients had malarial treatment with good pyrexia in November, 1928, but had shown no mental improvement. This patient had an excellent pyrexia following each injection of sulphur. A third patient whose first ten injections have been completed was a case of about three years' standing. He had been inoculated several times with malaria, always unsuccessfully. He was in a very advanced stage when the sulphur injections were commenced, and, owing to his lack of coöperation, it was impossible to record the temperature. He has, nevertheless, made a most remarkable improvement. He is now up and about, having put on much weight, and he is much better mentally. This case suggests that with reasonable care it is not essential to work by the temperature alone. Of the other cases, all have given or are giving excellent reactions, and five show considerable improvement already. It is, of course, too early to say much about clinical improvement.

Conclusion.

There seems no doubt that injections of sulphur in olive oil produce a high degree of fever, even in patients who have had malarial treatment previously or who have failed to react to malarial inoculation. The injections are simple and safe to give, and are well worthy of a trial by any practitioner. The earlier the diagnosis is made and the treatment commenced, the better is the end-result likely to be.

My thanks are due to my medical superintendent, Dr. R. Worth, for his permission to publish these cases.

Medical Societies.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

AT a meeting of this Society on May 8th, with Dr. F. J. H. COUTTS, the President, in the chair, a discussion on

STRICTURES OF THE URETHRA

was opened by Mr. JOCELYN SWAN. Nowadays, he said, the urological surgeon did not see the severe type of stricture which was formerly met with fairly commonly in hospital work. He did not doubt that this was largely because of better and more thorough treatment of venereal disease. Students now saw stricture cases at an earlier stage, and a patient was seldom allowed to go on to a serious condition before seeking expert advice. Strictures could be divided into congenital, traumatic, and inflammatory. The first two could be quickly dismissed. Congenital strictures were found in early childhood about the meatus or the posterior part of the fossa navicularis, and were due to errors of development. Valvular strictures, seen occasionally in the posterior urethra, were responsible for the very dilated ureters and hydronephrosis seen in infant life. Congenital strictures were often formed of mucous membrane with the concavity backwards, so that it was easy to pass a small catheter or bougie and conclude that no narrowing was present. But as soon as pressure of oncoming urine was exerted this membrane bulged forward and blocked the urethra. It was not so much a stricture as a congenital malformation of the urethra. Traumatic stricture was a more serious problem because of the length and often the tortuous form of the urethra after an injury. The urethral wall might be torn, and there might be discontinuity between the two ends. In the process of healing much fibrous tissue formed.

Inflammatory Strictures.

It was safe to say that fully 90 per cent. of inflammatory strictures followed gonorrhœal infection. Staphylococcal urethritis seldom produced stricture; its sequel was rather a superficial inflammation. Why should gonorrhœa occasionally result in stricture? It would be generally agreed that the cause was not so much the actual disease as the treatment which was applied to the gonorrhœal infection. And it was not usually the severe case which was followed by stricture, but the slight case, which often had been neglected, was tedious in treatment, and had persisted for a long time. He was sure he had seen patients whose urethral stricture was a result of long-continued over-treatment. Fortunately, however, this severe treatment by applying strong solutions to so-called mucous patches had largely gone by the board. In his early days he had seen many cases in which the urethra had been directly painted with silver nitrate, grs. 30 to 60 to the ounce, through an endoscopic tube. This was followed by septic infiltration of the urethral wall and definite stricture.

The reason why stricture was mostly in a particular position had given rise to much speculation; three-quarters of them were in the bulbous urethra. His view was that this was the site because it was the first part of the curve upon which the urine impinged in ordinary micturition. Stricture of the urethra also followed syphilis; he had seen many cases of meatal stricture following meatal chancre, and from the same

cause stricture in the terminal inch of the urethra; and likewise gummatous stricture. After gonorrhœal infection there was a deep infiltration extending through the mucous coat of the canal, followed by the formation of fibrous tissue. Strictures in the urethra were often multiple; indeed, some authorities said that 40 per cent. of them were multiple, but Mr. Swan did not put the proportion so high. When, therefore, the endoscope revealed a fairly wide stricture in the urethra it was necessary to make sure there was not also a deeper placed and narrower one. The tighter the stricture the more proximal it was. The lumen of the stricture was not necessarily in the centre of the infiltration; often it was placed eccentrically, and on passing a fine bougie the stricture was found to be a long one. The term "bridle stricture" he regarded as a misnomer; the band which was supposed to cross from one side of the urethra to the other was almost always formed by the passage of instruments, in other words, by a false passage. There had been a burrowing outside the urethral wall.

Effects of Stricture.

When the urethral canal was narrowed the thing that made most difference to the patient was dilatation of the proximal urethra, for with such dilatation came a liability to infection. The prostate, also, might be infected as a result, and in a secondary way the epididymis and bladder, and later the ureters and kidney. Infection was the bugbear of every surgeon who had to deal with strictures. As regards symptoms, when a patient complained of a persistent slight discharge the surgeon should in every case make a proper examination of the urethra, preferably with the endoscope. No significance attached to the so-called twisted stream described in text-books; a stream of fluid propelled through a vertical orifice was almost sure to emerge in a twisted form. What was significant was a statement that the stream had not the force it once had. Another complaint of a patient with stricture was his inability to finish off the act properly and cleanly; when he supposed it to be finished, a few drops subsequently dribbled into his clothing. That was an important sign, and the dribbling gave the surgeon an idea of how tight the stricture had become, and the degree of dilatation behind the urethra. Usually the man with stricture had not any appreciable increase in frequency; and if a patient with stricture complained of increased frequency, and especially of having to rise in the night to pass water, this was almost certainly due to infection having spread behind that stricture—in other words, the patient probably had cystitis. On the stricture becoming tighter there might be a history of retention, and this might occur even with wide calibre strictures. The patient perhaps caught a chill when motoring, or over-indulged in alcohol, and got an attack of retention in consequence. Occasionally there was the incontinence associated with an over-distended bladder. Mr. Swan looked upon the patient with an over-distended bladder, whether due to stricture or to an enlarged prostate, as in a very precarious position. The best and safest means of treating an over-distended bladder was to decompress the bladder very very slowly; one should never attempt to draw off all the urine at once.

Examination of Cases.

A general idea seemed to prevail that the first thing to do for a patient with stricture was to pass a bougie or sound; actually this was about the last thing to be done. In any case suspected or known to have stricture it was best to wash out the anterior urethra and inspect it with the endoscope, preferably with one capable of distension with air. This method should be used from the start. One could not only see the stricture, but could glean a good idea as to the size of bougie it would be possible to pass in the initial stage of dilatation. It should never be forgotten that strictures might be multiple, and that the one first seen might not be the only one or even the narrowest. With good distention and efficient lighting a stricture further down would be visible if it existed. If the surgeon decided to start examining with a bougie or a sound, he should use a flexible one at this stage, commencing with a 22 or 24 French (or No. 12 English). Passage should be carried out with the utmost gentleness, and with full aseptic precautions, and any obstruction met with must be noted. If there was obstruction a bougie should be found of a size which would just fit. When this had been passed enough had been done until the next sitting, five days later. Next time the surgeon began with this size and worked upwards. Mr. Swan never used a steel bougie smaller than a No. 15 French for much harm might be done by using smaller sizes in steel. He used sizes up to No. 19 French, and followed them up with steel sounds. The bougies should have a gradual taper, and English makers did not equal the French in this regard.

The urologist confronted with a patient complaining of difficulty of micturition or slowing of the stream should never omit to test the knee-jerks. Many patients were sent up as cases of stricture or prostatic trouble who were found to have early tabes or some other nervous trouble.

Complications.

The complications of stricture could be summed up in the words "retention and the outcome of sepsis," the latter including peri-urethral abscess, prostatitis, epididymitis, cystitis, pyelonephritis, and extravasation; this last was nothing more or less than a more acute form of peri-urethral inflammation, and could no longer be considered a true extravasation of urine, since it was due to anaerobic organisms getting loose and spreading into the cellular tissue. Fistula must also be included. It was not unusual to find that the dilated portion of the urethra behind the stricture contained a stone. In most cases, he thought, the stones had descended into the urethra and had enlarged there.

Treatment.

The treatment adopted in a particular case would depend not only on the size of the stricture, but on the accompanying conditions—i.e., whether the patient had a peri-urethral abscess or fistula or some other complication. Taking the stricture itself, the first aim must be to dilate it. Nowadays very few strictures were utterly impassable, but in dilating them it was very important to go slowly. It was possible to go up to a much larger size than was formerly taught, and he did not hesitate to go up to a No. 11 or No. 12 English, at least. After that one could pass on to the use of sounds. Continuous dilatation, by leaving the instrument in, was apt to set up urethritis, and this might lead to septic complications. If a patient had a very tight stricture—even if this caused retention—and if a fine or filiform bougie could be got in it should be left in and the patient should be allowed to dribble alongside it drop by drop until the bladder was in this way slowly decompressed.

As to the curability of a stricture, he would say that when it had reached a stage requiring dilatation it could not be more than relieved in this way. In a general way the axiom "once a stricture always a stricture" was true, but there were exceptions. A stricture could be dilated to No. 16 English, then the patient could be required to attend once a week or fortnight, and at the end of three months he should be re-examined with the endoscope; perhaps by then there would be little remaining of the stricture, and a longer time could elapse between sittings. This treatment should be followed by the regular passage of a sound. The neglected stricture would contract again.

Dilatation would not always succeed; there were cases in which the stricture was very hard and fibrous, so that it was very difficult to even dilate one side at a time. If after four or five days no impression could be made on the stricture, the speaker would cease these efforts and advise operation. Strictures which were resilient could be dilated, but the effect did not last; these also he preferred to operate upon. If attempts at dilatation of a stricture were accompanied by

bleeding, no further effort should be made for the day, and if there was a repetition of bleeding at a future sitting he would advise operation. Where a stricture was accompanied by epididymitis or a perineal abscess it should not be dilated, but should be operated upon. What should the operation be? In the absence of fistula or abscess he did not doubt that the best results ensued from internal urethrotomy. But this operation required experience; it was not as simple as the reader of text-books might believe. He did the Maisonneuve operation, cutting from the distal to the proximal side. A very fine guide was passed through the stricture; screwing it on to a steel guide, a filiform bougie was passed into the bladder, and the knife was passed down the steel director so as to divide the stricture. American surgeons deprecated tying in a catheter after doing internal urethrotomy, but the speaker did not know why they should. He left a catheter in for 48 hours, washing out the bladder morning and evening. At the end of 48 hours he filled the bladder, took the catheter out, and told the patient to pass urine. The old Syme operation, done on a director staff, he considered unnecessary, because if so large an instrument as a Syme director could be passed, the stricture was dilatable, and there was no need for the patient to be in bed three weeks. The only form of external urethrotomy was the Wheelhouse, in which the urethra was opened in front of the stricture, then the lumen was searched for with a guide and the stricture was divided. Another form was excision or resection of the stricture and joining up the two ends of the urethra. In resecting strictures he preferred to unite the upper wall of the urethra, leaving the inferior part open, and have a large catheter passed right through. If these procedures resulted in the patient having a rigor, he should be given hot drinks and hot bottles should be put round him.

A complication for which the surgeon should be prepared was high fever followed by anuria. This was sometimes so urgent that it called for decapsulation of the kidney. In one such case which ended fatally there was no lesion of the kidney to point to the reason for the anuria. In spite of all that could be done, anuria was almost always fatal. A peri-urethral abscess must be opened. If it were in the penile urethra it was better to open it through an endoscope tube than from the outside, which might cause a fistula. If the abscess developed in the perineum, it should be opened by a free incision, the stricture being treated at the same time.

With a stricture of fairly wide calibre retention might be abolished by putting the patient in a bath and giving morphia, afterwards wrapping him in blankets. A catheter should not be passed if this could be avoided. When a patient was declared to have renal inefficiency it meant that his kidneys were feeling the stress of back pressure or infection. Such a patient was losing his tone, and was beginning to lose weight; his appetite was not good, he had a dry tongue, thirst, and perhaps backache. His renal functions must be properly tested before manipulation of the urethra, and the tests should include estimation of the blood-urea. If the blood-urea was above 50 the kidneys were beginning to fail, and this meant an increased operation risk.

Mr. Swan concluded with a warning not to follow the tendency of the present day to rely on laboratory findings to the comparative neglect of purely clinical methods. Accessory tests should remain accessory tests.

Discussion.

Major F. C. DOBLE agreed that a large proportion of strictures were due to vigorous treatment of gonorrhœa. He thought the bulbous urethra was most often affected because the strong solutions used remained there.

Dr. T. J. WRIGHT (Norwich) asked about the prevention of embolism after passing the urethroscope, and spoke of the efficiency of Coleman's dilator.

Dr. H. C. SEMON spoke of a case in which stricture was complicated by condyloma acuminata, and asked whether caustic applications to the fossa navicularis were contra-indicated.

Mr. SWAN said that he had a great liking for Coleman's dilator in appropriate cases, and that for the condylomata mentioned by Dr. Semon he would use diathermy, as it left a soft and supple scar. Or radium might be used in such a case. The only filiform bougies he used were soft; he did not even go to the length of using whalebone ones.

INSTITUTE OF RADIOLOGY.

DOSAGE OF RADIUM THERAPY: DR. MURDOCH'S REVIEW.

AT the Institute of Radiology on May 8th the chair was taken by Dr. N. S. FINZI, and a lecture was given by Dr. JOHN MURDOCH of Brussels. When the permanent results of large radium institutes were compared, he said, a striking similarity appeared, despite the fact that very different methods were applied. It must be admitted that present methods were mainly empirical, lacking the indispensable basis of all scientific therapeutics—viz., an unquestionable unit of dosage. We knew everything about the dose emitted but nothing whatever about the dose absorbed by the tissues, and until quite recently it had been impossible to give correct instructions, based on physical data, for making surface masks. The method of ionisation, which had given excellent results in measuring X rays, had not been used to the same extent for measuring gamma rays, on account of technical difficulties due to the size of the ionisation chambers. Various investigators had tried to overcome the difficulty by using biological or photometrical methods. The biological tests tried had included the skin-erythema dose, the growth of germinating peas, the reaction of the epithelium of the uterus, the temporary castration dose, the intensity of necrosis in a rabbit's muscles, the decoloration of butter, and the percentage mortality in the eggs of ascaris. These methods could never be as accurate as physical tests. The size of the ionisation chamber prevented the measurement of radiation in the immediate vicinity of the source, just where the effects were most considerable. The smallest ionisation chambers were those of Ferroud (1·8 c.cm.), Sluys and Kessler (1·5 c.cm.), Mallet (1 c.cm.), Huth (0·5 c.cm.), and Glasser, Portmann, and Seitz (25 c.mm.), but in none of these could measurements be made at a distance of less than 1 cm. from the axis of the radio-active preparation. Prof. Stahel, of Brussels, had succeeded in 1928 in constructing a chamber of which the volume was only 2 c.mm., using a liquid instead of a gas medium to avoid diminution of sensitivity. Hexane, an ether of petroleum, had been selected. In this chamber the "wall effect" was only felt in a field a few tenths of a millimetre thick and the secondary electron rays covered a very short distance; the absorption of photo-electrons and Compton electrons was almost complete. The phenomenon described by Jaffé as "column ionisation," however, made it impossible to comply entirely with the conditions laid down in the definition of the international "r."

In 1918 and 1919 Regaud and Ferroud had adopted the unit of "destroyed millicuries," and the majority of Anglo-Saxon, German, and Scandinavian radiologists used the milligramme hour. Both these systems defined the quantity of radium used and the time of treatment, but ignored filtration and distance. The "D" unit of Mallet and Proust bore no relation to other physical units. Deauvillier had proposed the erg as a curie-therapeutical unit in 1923, and in 1928 Stahel had adopted this and measured the quantities of energy absorbed by units of volume of irradiated tissue, the results being expressed in calories-cubic centimetres or ergs-cubic centimetres. Stahel's method of making these measurements was ingenious and delicate, involving the estimation of ten-thousandths of a degree centrigrade per minute, and the elimination of heat due to alpha and beta rays.

Clinical Application of the Erg-Cubic centimetre Unit.

The combination of ionometric and energy measurements had enabled the physicist to draw up a series of isodoses corresponding to the various needles and tubes in use. The curves had been established for a standard tube containing one milligramme of radium element, and the figures shown in the various curves were those of the quantities of ergs absorbed per hour by a cubic centimetre of tissue at the spot under consideration. Curves had been plotted in planes parallel with the main axis of the preparation at graduated distances from 0·5 to 5 cm., and also at perpendicular planes. By means of these planes of isodoses an irradiation scheme could be prepared to ensure homogeneity of dosage throughout a tumour of any form and surface, with a determined surface- and depth-measurement of absorbed energy.

Dr. Murdoch then showed slides illustrating the preparation of schemes for tumours with flat and curved surfaces respectively, with and without a support of Columbia wax. The arrangement was principally based on tubes containing 13·33 mg., but where the dose was too small it could be increased by adding tubes of 6·66 mg. or needles of 1·33 mg., dividing the values by half or ten respectively and adding 6 per cent. for needles to make up the difference in filtration. When a curved surface was to be irradiated the correction resulting from the convergence of the γ rays had to be established. Once the arrangement and power of each source of radium had been chosen in such a way as to ensure that each spot of the radiated surface received almost the same quantity of energy in erg-cubic centimetre milligramme-hour units, the time of application was determined automatically from a table.

Appliances and Cases.

A row of five standard 1 mg. tubes produced very unequal radiation at a depth of 0·5 cm., the difference between the two extremes being 25 per cent. Inequalities disappeared, however, at a distance of 1 cm., and still more at 2 cm. At a depth of 1 cm. a single tube gave a maximum of 1400 ergs-cubic centimetre milligramme hours, but five tubes increased the intensity to 2200 ergs/c.cm. mg. hr. Five parallel tubes also gave a very heterogeneous absorption at 0·5 cm. but an almost homogeneous radiation at 1 cm., the maximum intensity being 1·43 times that of a single tube. Twenty-five tubes arranged in five rows at equal intervals of 20 mm. gave a central field of about 6 cm. diameter at a depth of 1 cm. with a practically homogeneous radiation of 4520 ergs/c.cm. mg. hrs. Four tubes arranged in a cross in a circle of radius 2 cm. meant a deficient irradiation of about 15 per cent. in the centre. If they were brought 5 mm. nearer the centre the energy received there would increase from 1600 to 2600 ergs/c.cm. mg. hrs., and if they were moved 5 mm. away it would decrease to 1000 ergs/c.cm. mg. hrs.

Dr. Murdoch then showed slides of a number of typical cases treated by these methods, illustrating their application to neoplasms of the face, palate, nose, and neck. One of the great advantages, he said, was the possibility of making masks to cover large surfaces with a relatively small quantity of radium. It was quite easy to limit exactly the border-line of the irradiation and to avoid all overlapping and all underdosing of intermediate areas.

The skin was very radio-sensitive, and a slight erythema was caused by a dose of 450,000 ergs/c.cm., as by a dose of 600 r. given in one séance. A dose of 550,000 ergs/c.cm. caused frank erythema and brown pigmentation and 600,000 ergs/c.cm. caused a deep red erythema followed by desquamation. Radio-epidermitis with blisters and strong pigmentation was produced by 700,000–900,000 ergs/c.cm., and higher doses might cause serious burns. A dose of 400,000 ergs/c.cm. would cause conjunctivitis lasting less than six weeks. Mucous surfaces could absorb much larger doses; the mouth could stand more than 900,000 ergs/c.cm. with a reaction lasting four or five weeks and consisting of a white diphtheroid membrane. Similar doses could be applied to the vagina. The tongue could absorb large amounts without loss of substance or marked fibrosis; in one case over 5,000,000 ergs/c.cm. had been absorbed in the tumour and over 3,000,000 units at a centimetre beyond its borders. The tumour depths thus received quantities of energy amounting to ten times the erythema dose; the cicatrisation had been normal. Similarly in the vagina the absorption of eight times the erythema dose did not cause any exaggerated reaction and cicatrisation was complete after six weeks. The distribution of isodoses round the uterus showed how rapidly the intensity fell off. At a distance of 4·5 cm. from the cervix the intensity at the level of the parametria was only equal to a single erythema dose—i.e., 600,000 ergs/c.cm.

In conclusion, Dr. Murdoch said that the adoption of a unit indicating the amount of energy absorbed per unit of volume of tissue made dosimetrics independent of technical conditions. The dose received and not the dose emitted was measured and the only essential elements were the amount of energy absorbed at the surface, the percentage of the depth dose, and the time of application. Different treatments and types of treatment could thus be compared. Moreover, the handling of radium was reduced to a minimum. The plan was worked out on paper and scratched on the wax and the tubes were put in place in a few minutes.

At first sight it seemed impossible to administer these amounts of energy by any method that necessitated the irradiation of the skin, such as the radium bomb.

ROYAL SOCIETY OF MEDICINE.

SECTION OF THERAPEUTICS AND PHARMACOLOGY.

AT a meeting of this Section, held on May 14th, the chair was taken by Dr. PHILIP HAMILL, the President, and a discussion on the

TREATMENT OF DISSEMINATED SCLEROSIS

was opened by Sir JAMES PURVES-STEWART. He said that the irregularity of the course of the disease and the frequency of remissions and relapses enhanced the difficulties of discussing the subject. Alleged "cures"—very few of which were on record—were either cases of wrong diagnosis or of prolonged remission. Treatment might be by drugs—of which arsenic was the most useful, especially the silver salvarsan type—or by specific causal methods. Exogenous vaccines had proved very useful in many hands and might act by producing a pyrexial reaction or by protein shock. The causal method had become attainable since the discovery of a specific organism.[1] Miss Chevassut had cultured an organism from about 93 per cent. of 200 cases, with a large control series. Cases which had given negative results had been found to be under arsenical medication. The organism, *Spherula insularis*, was not unlike that of bovine pleuro-pneumonia and had two forms—a sphere and a granule. A large sphere was about the size of a staphylococcus and a large granule about one-tenth of that size. Culture had to be made in Hartley's broth to which human serum had been added; the organism was very sensitive, and its culture demanded considerable care and experience. Injection of the culture into monkeys had at first proved disheartening, but eventually two out of six had developed degenerations. One showed them in the direct cerebellar tract and at the junction of the postero-internal and postero-external tracts, with spots of degeneration also in the lateral tracts. In the second monkey the degeneration was in the antero-median region. An inhibitory substance sometimes appeared in the blood of rabbits and of patients after successful vaccine treatment, but an

[1] THE LANCET, 1930, i., 552.

anti-serum had not yet been produced. In consequence of this discovery vaccines had been made from actively growing cultures, either in serum or in normal saline, and both gave satisfactory results. The virus must be killed by phenol, not by heat. Over 200 patients had been treated but only 73 had yet been under observation long enough for study—i.e., for at least two years. In these 73, encouraging serological and clinical results had been obtained. The globulin reaction diminished and disappeared and the gold curve and cultures became completely negative, while the blood became inhibitory to the growth of the organism.

Signs and symptoms came to a standstill and in some cases improved, although, of course, having a residue corresponding with the degenerations. Among eleven early cases negative cultures had been obtained in five, and nine had shown improvement in their gold and globulin reactions. Of 29 moderate cases, six had become negative while 23 had improved. In 33 advanced cases there had been no negative cultures, though in 20 the gold and globulin reactions had diminished. Two or three series of twelve doses of vaccines of increasing strength were usually needed before any objective improvement was obtained, although clinical improvement began early. That this improvement was not merely remission was shown by the fact that in remissions the serological findings were still positive and the organism could be cultured from the cerebro-spinal fluid.

Discussion.

Dr. DOUGLAS MCALPINE referred to work by Adams, of Glasgow, and others on the improvement of the cerebro-spinal findings after arsenical treatment. This had been in favour of the effect of arsenic. He asked if there could be a control series of serological tests in cases treated by arsenic, and another to show whether arsenical treatment caused any inhibitory effect of the blood-serum on the spherula.

Dr. WILFRED HARRIS congratulated the authors on what he hoped would be a far-reaching advance in therapeutics, whether or not the spherula proved to be the causative organism of disseminated sclerosis.

Dr. KINGSTON BARTON said he had known cases which had had very little treatment go on for a very long time. Disseminated sclerosis was mixed up with psychosis, and light might be thrown on it from that side. In private practice one of the greatest difficulties was the liability to bacilluria, and hexamine might hold the balance between health and illness. Insomnia might be controlled by giving very minute doses of hypnotics—e.g., half a grain of veronal, and in this way drug addiction could be avoided.

Dr. HILDRED CARLILL asked what should be done in clinical cases of disseminated sclerosis in which the organism could not be found. He had had remarkable success with the vaccine.

Miss KATHLEEN CHEVASSUT said that it was quite impossible to get a culture if the fluid had been contaminated, and completely sterile lumbar punctures were difficult to secure. Only a small percentage had proved negative, and it was worth while to do repeated lumbar puncture. There seemed to be some unknown factor that influenced cultures. A trace of arsenic in the cerebro-spinal fluid inhibited culture, but this did not necessarily mean that it destroyed the organism in the body; it might have a mechanical effect. The colloidal gold curve had been fully investigated in Sir James Purves-Stewart's cases, both disseminated sclerosis and controls, and its relation with arsenical treatment had been studied. The Glasgow cases had had intensive arsenic treatment, and possibly the effects of the arsenic excreted into the cerebro-spinal fluid had chemically interfered with the very delicate gold reaction. The infective agent was probably not the sphere but the granule, and a very wide field of research was still open in this connexion.

The PRESIDENT asked whether the vaccine used was always autogenous and whether it degraded on keeping and must be freshly prepared.

Dr. Z. KUBIE asked whether there were any indications of a living process, such as consumption of oxygen and evolution of carbon-dioxide, in these cultures, and also whether the interval between the induction of treatment and the appearance of remission showed any constancy. Recent work in New York hinted that there was a lipolytic agent in the blood-serum of patients of disseminated sclerosis; some suggestive results had been secured with quinine.

Miss CHEVASSUT said the vaccine was merely a culture killed with phenol. The number of granules was counted under the microscope and the number per c.cm. calculated. The difficulty lay in the recognition of the positive culture and not in the preparation of the vaccine. It must be given intravenously to be effective and must be autogenous. It did not seem to keep more than three months. It was given at weekly intervals.

Dr. BROUGHTON ALCOCK asked at what stage a patient was declared unable to respond, and if any injury followed the use of the vaccine in the late stage. Was there any simple laboratory method of diagnosis?

Sir JAMES PURVES-STEWART, in reply, said that the diagnosis was both clinical and serological. In some very slight cases the serological observations were very valuable, but the disease should never be excluded on a laboratory specimen. Sometimes a patient would be a little sleepy or have a few minutes' collapse after a large dose; no other bad effects had ever been seen. The extent of the disease and not the time that had elapsed was the important point in classifying a case as "early" or "late." Clinical improvement often appeared in a month or two, and serological improvement was noted after the first course of vaccine. Psychological factors played a part, as in any disease, but did not change serological reactions. The Glasgow work was in accordance with Miss Chevassut's observations. So far, the risks of making a stock vaccine had prevented the attempt, but that was, of course, the object of research. At present patients with profound permanent degenerations were not treated.

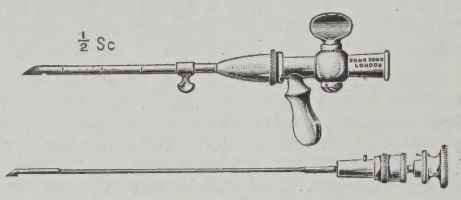
MIDDLE-CLASS PAYING WARDS.—The experiments begun two years ago by the Norfolk and Norwich Hospital of opening a house for the treatment of paying patients of the middle class has been so successful that the accommodation is to be enlarged. The house, which is adjacent to the hospital, and is run as an integral part of it, originally contained 12 single rooms with a theatre, but two rooms were subsequently added, and now a new ward of 20 beds is to be built. All patients are under the care of a member of the honorary staff, and admission is obtained either by paying £4 4*s.* per week plus a sum for medical attendance, which must not exceed 15 guineas, or by joining a contributory scheme with premiums amounting to 30*s.* a year. The cost of the new building will be defrayed in about eight years by the balance left from contributors' premiums, after deducting 12*s.* a day for each in-patient, and a levy from the fees of the honorary medical staff.

OPHTHALMIC HOSPITALS.—Last year the Royal Westminster Ophthalmic Hospital treated 1110 in-patients and 12,482 out-patients. The 14 rooms provided for patients who, while ineligible for admission to the public wards, are unable to pay nursing-home charges, have been used during the year by 130 patients. An electrotherapeutic department and a department for the treatment of squint have been opened.—The Royal London Ophthalmic (Moorfields) Hospital treated 2534 in-patients who were residents, on the average, 15·02 days and cost £3 7*s.* 2·05*d.* per week. There were 51,924 out-patients who cost 6*s.* 4·64*d.* each; there were 3386 operations in the out-patient theatre. In the refraction department 11,687 (5008 new) London County Council school-children received attention.

New Inventions.

A NEW PNEUMOTHORAX NEEDLE.

THE needle as shown in the sketch is made so that information of the position of the point as it goes through the chest wall is given by the manometer before the stilette is withdrawn. The needle is of the orthodox "Clive Riviere" pattern and has a terminal and lateral opening. The stilette, when in use, closes the terminal opening, but does not obstruct the lateral opening. It is kept in position by a small pin which fits into the opposite end of the instrument. This prevents the stilette turning round when in use. The needle is sharp-pointed, slightly bevelled, and when passed into a patient's chest with the stilette in use gives a reading on the manometer of the pneumothorax apparatus immediately the lateral orifice enters the pleural cavity. It has been found in practice that the lateral orifice does not get blocked in passing through the chest wall. The instrument is particularly useful in induction of the treatment.

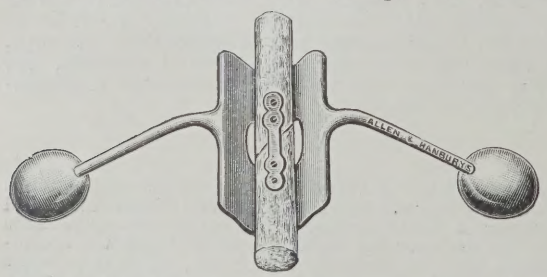


Messrs. Down Bros., Ltd., 21 and 23, St. Thomas's-street, London, S.E.1, are the makers.

FREDERICK R. G. HEAF, M.D., M.B.Camb.

RETRACTOR FOR BONE-PLATING.

THE illustration shows a pair of retractors which have been in use for the last two years and I have found them a great convenience, particularly in plating the shaft of the femur through the anterior incision described by Fleury. Owing to their slightly clawed edges which meet behind the linea aspera and to their



weighted outer ends, they are self-retaining. When they are in place with the towels tucked round outside them, they leave nothing exposed except the necessary length of bone including the fracture. The risk of infection or laceration of soft structures is minimised and the fixation of the plate is easier because the exposure is so complete. There is no difficulty in applying them; they stay put until removed; and their weighted outer extremities tend to lift forward the bone and restore its natural anterior bow.

The retractors are made by Messrs. Allen and Hanburys, Ltd., 48, Wigmore-street, London, W.

MAURICE G. PEARSON, B.Sc., M.B.Lond., F.R.C.S.

NEW FALMOUTH HOSPITAL.—Two Cornishmen resident in South Africa, Mr. William Mountstephens, a native of Falmouth, and Mr. Albert Charles Collins, a native of Stithians, have jointly presented Falmouth with a new hospital which has cost £16,000 without counting site and equipment, and was opened recently by Mrs. German, of Truro, a sister of Mr. Mountstephens. There are men's and women's wards of 12 beds each, and a children's ward with eight cots.

Reviews and Notices of Books.

HUMAN SPEECH.

Some Observations, Experiments, and Conclusions as to the Nature, Origin, Purpose, and Possible Improvement of Human Speech. By Sir RICHARD PAGET, Fellow of the Physical Society of London, and of the Institute of Physics. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1930. Pp. 360. 25*s*.

THE scope of this work is well described in the sub-title, and covers observations, experiments, and conclusions on the nature, origin, purpose, and possible improvement of human speech. Sir Richard Paget has made very extensive experiments into the mechanism of the production of vowel sounds and of consonants, and has confirmed his theories by making models which imitate with a high degree of accuracy the various sounds produced by the human organs of articulation. He finds that the sounds produced in articulation are musical tones of definite pitch, the result of characteristic combinations of resonances set up in the human vocal cavity when tongue and lips are set in different and appropriate postures. In vowel sounds the main result is to produce, at each posture, a different pair of principal resonances, each pair being in association with a particular vowel. The pitch of these resonances is more easily recognised when speech is whispered; the effect of phonation is to cause, by vibration of the vocal cords, the passage of rhythmically pulsating air which colours the musical note by emphasising such overtones as lie within the pitch of the resonators. The production of the consonants is more complicated, for more than two resonators are in action; they are marked out, not only by pitch, but also by their change, and rate of change, in pitch, and they are all made by complete or partial closures of the front or back orifice of the anterior oral resonator. The essential difference between the so-called unvoiced and voiced consonants is not that of phonation, for they can be clearly distinguished in whispered speech; the difference is one of resonance, and the voiced series are produced, when whispering, either by the acoustic effects of direct access to the trachea, or by the resonance of a cavity formed between the true and false vocal cords. Dr. G. Oscar Russell, of Ohio University, has employed a form of pharyngoscope by which the movements of the throat can be studied during speech; this action of the ventricular bands, to form a resonating cavity, has been established by these means, which also show that the epiglottis coöperates, by a backward movement, in forming a constriction to produce a posterior resonator. Thus it is claimed that these parts of the larynx both act as essential organs of articulation.

The remainder of the book has less special interest to the laryngologist. In it the author develops the theory that language originated in gestures made with the lips and tongue in substitution for gestures made with the hands, which were becoming increasingly occupied with other functions. This "gesture theory" is copiously supported by an examination of the position of the lips, tongue, and mouth in the simple words of primitive languages. Finally, the author gives his views on the imperfections of language, and his suggestions for its improvement, for he believes that any imperfections of an existing language which cause difficulty in the process of coding thought into speech, or decoding speech into thought, are a stumbling block to the intellectual and material progress of the people who speak the language in question. We are all aware that modern languages and modern spelling, which have been evolved spontaneously, are full of serious defects—for instance, we have but five symbols for our thirteen or fourteen fundamental vowel sounds—but some of us are doubtful whether drastic conscious attempts at improvement are either possible or likely to be successful. Sir Richard Paget does not

advocate simplified spelling, or any other particular system, at the present time; he pleads for a period of liberty from rigorous orthography, coupled with the teaching of the phonetic alphabet to all English-speaking children, and the foundation of an "English-speaking Union," directed towards the improvement of the language and the ultimate standardisation of its pronunciation. Two points of medical interest are to be found in this part of the book. One is the suggestion, on the oral teaching of deaf mutes, that whispered speech should be taught in the first instance, as being homogeneous and simpler. The second is that, after excision of the tongue, the natural resonance of the vocal cavity is altered and lowered by increasing its volume and that this destroys the accurate reproduction of speech sounds; it is suggested that the original resonance might be restored in such cases by effectively lowering the roof of the mouth by means of a plate.

The book is written in a most lucid and interesting manner; Sir Richard Paget deserves congratulation on the results of an immense amount of patient labour in a field which has hitherto not received much attention.

DISEASES OF WOMEN.

Seventh edition. By HARRY STURGEON CROSSEN, M.D., F.A.C.S., Professor of Clinical Gynecology, Washington, University School of Medicine, &c.; and ROBERT JAMES CROSSEN, M.D., Instructor in Clinical Gynecology and Obstetrics at the same school. London: Henry Kimpton. 1930. Pp. 1009. 50*s*.

THIS book, which has established itself as one of the leading text-books on gynæcology in any language, has been well known in this country for many years. It is so well written and illustrated that the authors' argument can be followed without difficulty. During the four years since the last edition was published a considerable amount of experimental work on the physiology of reproduction and its relation to diet and internal secretions has been published. This work has been incorporated and serves to clear up our ideas on these subjects, although much is still obscure.

The author's attitude adopted towards radium treatment of cancer of the cervix is worthy of note. In America generally the radical operation is regarded as obsolete and radium as the only proper form of treatment. Prof. Crossen takes the view that the operation is not obsolete and should be employed in early cases with preliminary radium. This is an illustration of the balanced outlook maintained throughout the work.

CLINICAL PEDIATRICS.

Diseases of the Skin in Infancy and Childhood. By HOWARD FOX, A.B., M.D., Professor of Dermatology and Syphilology, New York University; Former President American Dermatological Association. Supervising Editor: R. S. HAYNES, Ph.B., M.D., Clinical Professor of Diseases of Children, Columbia University, New York. London: D. Appleton and Co. 1930. Pp. 372. In three volumes. Vol. XVI. 48*s*.

THIS is a straightforward and thoroughly scientific treatise on the cutaneous affections commonly met with in infancy and childhood. The author is one of the most prominent of American dermatologists, and is frequently an honoured guest at meetings held in other countries. In his classification and the general arrangement of his book he adopts a compromise between ætiological factors and clinical appearances, noting that there can be no really satisfactory solution of the difficulties until it is possible to base nomenclature on the known causation. Designed for the use of the practitioner, the book has hardly any histological descriptions or plates, but the deficiency is more than balanced by a wealth of clinical photographs, all most carefully selected to illustrate typical cases. There are 20 chapters, a brief and very simple formulary which contains all that the most scrupulous practitioner needs to memorise. The chapters on eczema and the tuberculides are particularly well done; it is interesting to note that lichen nitidus finds a nosological place among the latter, and that lupus erythematosus and granuloma annulare are also classed as tuberculous in origin, although in Europe their ætiology is still sub judice. Certain opinions are expressed about the treatment of tuberculosis verrucosa cutis, scrofuloderma and erythema induratum, with which few dermatologists in this country would agree. The two former diseases would not here be submitted to X ray therapy, but to surgical and actinotherapeutic measures, while it is our experience that Bazin's disease (erythema induratum) mostly yields to a few doses of novarsenobillon.

The book, which is very well got up, will be useful to all without special dermatological training, particularly to those working with children.

RECENT ADVANCES IN CARDIOLOGY.

By C. F. TERENCE EAST, M.A., M.D Oxf., F.R.C.P.Lond., Junior Physician, King's College Hospital; and C. W. CURTIS BAIN, *M.C.*, M.B.Oxf., M.R.C.P.Lond., Assistant Physician, Harrogate Infirmary. London: J. and A. Churchill. 1929. Pp. 342. 12*s*. 6*d*.

THIS book reviews advances in cardiology made during the past ten years or so, more especially for the benefit of practitioners who qualified before that time. As the authors point out, the advances to which they refer really go back farther, and date from the work of Mackenzie. In recent years the tendency has been to devote less attention than previously to morbid anatomy and more to the disturbances of cardiac function, the study of which has been greatly facilitated by the introduction of the polygraph and electrocardiograph. It is principally with functional disorders and their diagnosis and treatment that the book is concerned. The opening chapter on coronary thrombosis is the best in the book; it gives an admirable account of the condition. This is followed in the natural sequence by a summary of the current views on the ætiology of angina, and a consideration of a miscellaneous group of factors helpful in the diagnosis of myocardial disease. Some of these hardly seem to merit a place amongst "recent advances." Gallop rhythm, for example, has long been recognised as a sign of sinister significance, and nothing of importance has been added to our knowledge of this disturbance in recent years, nor can we fairly claim to have made much advance in the treatment of the cardiac complications of pneumonia. Sections such as these might be better described as current conceptions rather than recent advances in cardiology. But they are none the less likely to be of value to practitioners provided they remember that the work is not intended to be a text-book and deals only with one aspect of the subject. The chapter dealing with the X ray examination of the heart is concise and well illustrated, and the chapter on the electrocardiograph gives a clear account of the fundamental principles on which this method is based.

PRACTICAL MASSAGE AND CORRECTIVE EXERCISES.

Fifth edition. By HARVIG NISSEN, late President of Posse Normal School of Gymnastics, and Lecturer and Instructor of Massage and Swedish Gymnastics at Harvard University Summer School. Philadelphia, Pa.: F. A. Davis Company. 1929. Pp. 271. $2.50.

THIS book is not calculated to find any great demand in this country. The student in training will find it inadequate to meet his or her paramount need, that of satisfying the examiners of the Chartered Society of Massage and Medical Gymnastics, while

medical men will require something far more authoritative and up to date. The traditional teaching of bygone ages is reproduced, regardless of the advance in medical knowledge. Forcible stretching is still included under the head of "Passive Movements," and we read of the value of kneading, which is "used to crush newly formed vessels." We are told that another form of massage may cause "impure matters" to be "more firmly embedded in the walls of the blood-vessels," and other relics of the past are included in the text. Even the anatomy is not up to date, as an elaborate argument is based upon the supposition that inversion and eversion of the foot takes place at the ankle-joint, while the description of the action of various muscles is misleading. On the pathological side we are told that "great force must be applied when the shoulder or elbow-joints are stiff from dislocations, fractures" without any word of warning as to its dangers, and the perilous advice is given elsewhere that "muscles and nerves" should be put on the full stretch, "especially in paralysis." These are merely a few examples drawn from a large number. Those who wish for guidance in the matter of physical treatment should seek it elsewhere.

LE DIAGNOSTIC DES ANGINES AIGUËS.

By A. B. MARFAN, Professeur Honoraire à la Faculté de Médecine de Paris, Membre de l'Académie de Médecine. Paris: Masson et Cie. 1929. Pp. 87. Fr.10.

IN writing this little book on acute inflammations of the throat Prof. Marfan had two objects in view. He wished to show that on purely clinical examination it is possible, in the majority of cases, to make a diagnosis of diphtheria, thereby enabling anti-diphtheritic serum to be given without delay; also he wished to plead for a revision of the clinical descriptions of the acute inflammations of the throat, in particular the so-called herpetic type. The early administration of serum in diphtheria is clearly so important, from the point of view both of treatment and prophylaxis, that for this section this book is of value; It is obviously written by one with wide experience of throat affections and should prove helpful to those who are called upon to make difficult decisions. The concise account of the many acute conditions met with in the throat, with special stress on the differential diagnosis from diphtheria, is admirable.

MEDICAL INSURANCE EXAMINATION.

Modern Methods and Rating of Lives. Second edition, enlarged. By J. PATERSON MACLAREN, B.Sc., M.B., C.M., late Examiner for University of Cape of Good Hope and Chief Insurance Medical Officer. London: Baillière, Tindall and Cox. 1929. Pp. 646. 30*s*.

IN his introductory remarks the author emphasises the extreme importance of medical examination for life insurance. He maintains that ability to assess length of life can only be attained after years of experience of diverse forms of practice. Recent developments in aids to diagnosis have in his view, led to greater accuracy in this assessment. The book is divided into three parts. The first describes and explains the general examination and confidential report; the second deals with the examination of the various systems in detail, and the third with diseases as insurance impairments. A brief outline of the methods adopted in rating is given; diseases of the various systems are clearly discussed and tables are included showing the ratings adopted by various companies for degrees of disease or deviation from normal. In this edition the problems of diagnosis and prognosis in relation to abnormalities of blood pressure, early pulmonary tuberculosis, heart murmurs, new growths, glycosuria and albuminuria have been dealt with more fully. Throughout an effort is made to show how the various findings should be correlated by an examiner in assessing a risk; for example, in reporting on hypertension the examiner is advised to put to himself such questions as: Has the proposer a strong will? Does he indulge in any excesses? Will he be likely to amend his diet habits or mode of life? On the answers will depend his recommendation to accept, with or without loading, to postpone, or to reject. The ratings quoted are exceptionally full; the book is amplified by 12 illustrations, and in the index heavy type is used to direct attention to the more important references. The book clearly expresses the special attitude which the insurance examiner should adopt to medicine, and might be read with advantage by the general physician who is largely concerned with prognosis as well as by those who do many examinations for insurance.

DIETETICS.

The Science of Nutrition Simplified. By D. D. ROSEWARNE, M.R.C.S. Eng., L.R.C.P. Lond., late Honorary Actino-Therapeutist and Assistant Physician, City of London and East London Dispensary. London: Henry Kimpton. 1929. Pp. 314. 6*s*. 6*d*.

Food Values in Practice. By ETHEL M. DOBBS, M.A. Lond., Lecturer in the Department of Hygiene and Public Health, Battersea Polytechnic. London University Press, Ltd. 1929. Pp. 240. 4*s*.

Dr. Rosewarne's small book aims at presenting the most important principles of nutrition in language that can be understood by the ordinary reader. Its last chapter is devoted to an account of some of the larger text-books dealing with particular aspects of the subject for the benefit of readers who wish to study the science of nutrition more thoroughly. The exposition of the subject is clear and, on the whole, free from prejudice. The section dealing with infant feeding is disappointing in view of the promising results that are being obtained all over the world by the application of modern knowledge to the problem of the prevention of disease in early childhood. Cow's milk, with the possible addition of lactose, is apparently considered a complete diet for the infant from birth till the age of nine or twelve months. Those with experience of the feeding of infants in large cities will not agree that such a diet can ensure the prevention of rickets, the formation of good teeth, and the prevention of nutritional anæmia.

Miss Dobbs aims in her little book to provide a working knowledge of the essential functions in the human body, and at the same time to give practical instruction in the marketing and storage of food, the construction of dietaries, and the methods of cookery. The fact that she is acquainted with some of the modern discoveries in the field of nutrition will not necessarily ensure that the housewife supplies her family with the food best calculated to keep them in good physical condition. Those with limited incomes are bound to find difficulties in purchasing a sufficiency of the protective foods that are needed at all ages, and even such foods may not exert their full beneficial effect if they are purchased without due regard to individual qualities, or are injudiciously cooked and served. The instruction here given will help the organiser of the household budget to choose wisely. The last hundred pages are devoted to selected recipes suitable for healthy individuals and for those suffering from simple ailments such as constipation and obesity. A practical book such as this should prove of great value to the housewife, whether she be rich or poor.

Buchanan's Dissection Guide, edited by E. Barclay-Smith, R. H. Robbins, and J. E. Frazer, has just been published by Messrs. Baillière, Tindall and Cox at the price of 10*s*. 6*d*. (not 12*s*. 6*d*., as erroneously stated in an advertisement).

THE LANCET.

LONDON: SATURDAY, MAY 17, 1930.

THE TEACHING OF PREVENTIVE MEDICINE.

THE progress of education is marked by the efforts of the teachers who have gained a footing in the curricula to obtain greater recognition for their subject, and the struggles of reformers to find room for new fields of study. Science is still contending with the classics against heavy odds in the scholastic world, and in elementary education the three r's are faced with the encroachments of art, domestic science, hygiene, and handwork. Indeed, since continuity of policy and freedom from turmoil are necessary to the pursuit of learning, it would be disastrous if chopping and changing of curricula to meet the desires of educational radicals were unresisted by their more conservative, because less dissatisfied, professional colleagues. In medicine this struggle for recognition is more frequently recurrent and more acute than in other provinces of education, because the march of knowledge is more rapid and along so irregular a front. New developments lead to new specialisms and new lectureships, and time has to be found for each of these subjects in the curriculum.

This constant state of flux in medical education has, of course, resulted in a good deal of unevenness in the allocation of time to different studies in the various medical schools, in spite of the coördinating influence of the General Medical Council. The presence in a particular school of a brilliant exponent of some branch of technique, or the accident that a chair or lectureship has been endowed, may be determining factors, and experiments of this kind help us to assess the value of special courses of study before they are generally accepted. A time arrives, however, when it is desirable to pool experience and to arrive at a national policy. The Society of Medical Officers of Health, being impressed with the unsatisfactory provision made for the teaching of preventive medicine in several schools, appointed last year a committee, under the chairmanship of Prof. W. W. JAMESON, to inquire into this subject and also into the requirements of the various examining bodies. Their report, which appears in the May issue of *Public Health*, sets out in detail the status of the teachers of this subject, the number of lectures and demonstrations given, the syllabus in certain schools, and the examination requirements. A useful summary is also given of the position in foreign countries. Briefly, the information collected indicates that there is great inequality in the teaching of preventive medicine in the different medical schools of this country, lecture courses varying in length from 10 to 60 lectures and practical demonstrations from nil to 12. On the whole, European and American countries appear to devote more time and attention to the subject. The committee has made recommendations which, in view of the importance of preventive medicine, cannot be regarded as unreasonable even by those who are alarmed at the prospect of an overloaded curriculum and further extension of the period of undergraduate study. The number of lectures, it is suggested, should be not less than 24, the course being held not earlier than the penultimate year of study, and no student should be allowed to qualify without having passed a separate examination in public health and preventive medicine.

Most important of all, however, is the prominence given throughout the report to the need for permeating the whole curriculum with the preventive idea. It is now seven years since the General Medical Council resolved that "throughout the whole period of study the attention of the student should be directed by his teachers to the importance of the preventive aspects of medicine" and Sir GEORGE NEWMAN, in his "Recent Advances in Medical Education in England," showed how it could be done. Yet the committee of the Society of Medical Officers of Health has been unable to ascertain any instance of a school where a concerted endeavour can be said to have been made to introduce into the teaching a real emphasis on the importance of prevention. The schools are lagging behind public opinion. It is notable that the state of affairs is worst in London, where teaching is based on hospital units, and where the atmosphere, necessarily clinical, is uninfluenced by the great public health movement of which the health authorities are the centres. In the provinces, and especially in the ancient universities of Scotland, where there is more community of interest between town and gown, the place of prevention is less liable to be forgotten by those responsible for teaching medical students. The Society of Medical Officers of Health are forwarding their committee's report to the General Medical Council by whom it will no doubt receive the consideration which it deserves.

THE COST OF LITIGATION.

THE London Chamber of Commerce, through a subcommittee of its Parliamentary and Commercial Law Committee, has been examining the causes of the present high cost of litigation and the possibility of mitigating them. One suggestion in the subcommittee's report is that in all cases involving technical matters an assessor should sit with the judge as adviser, in the same way as the Elder Brethren of the Trinity House in Admiralty cases, to assess damages. No expert evidence, says the report, should be given; but in cases involving more than, say, £2000, the parties should be allowed each to put forward one expert on each side to act as a demonstrator of the technical points at issue, though not as a witness; in cases over £10,000 the parties to be allowed to call one expert witness on each side if they wish. The possible use of members of the medical profession as assessors is a point which has often been urged in the past. Workmen's Compensation Act procedure has managed to take advantage of medical knowledge in this way and machinery exists by which a High Court judge could avail himself of medical assessors' services though he is naturally reluctant to relinquish his judicial responsibilities. The Chamber of Commerce plan, however, seems more suitable for cases concerning commercial contracts than for the kind of litigation in which doctors are themselves mainly concerned. Rule-of-thumb scales for valuing litigation will hardly suit actions against physicians or surgeons for alleged negligence. Would *Harnett v. Bond*, for instance, have been classified beforehand as a £2000 case or a £10,000 case? Other recommendations in the subcommittee's report appear similarly to have special application to the classes of proceedings dealt with in the Commercial Court rather than

to the ordinary actions which come before a jury. There is a suggestion that pleadings be further cut down and that viva voce evidence and cross-examination be eliminated and replaced by agreed documents and brief signed statements. A case like *Crotch v. Miles* could hardly have been dealt with thus. To deny the right to call expert witnesses may amount to a denial of justice. Endeavours have been made, notably in the Chancery Division where there are no juries, to limit the numbers of expert witnesses; but these efforts are not universal. Undoubtedly the modern trial is unduly prolonged. A fashionable leader nowadays takes several days over a cross-examination where the giants of the past were content with a couple of hours. Yet brevity sometimes defeats itself, nor have all judges the same standard of brevity. Lately, in a claim for damages arising out of a motoring accident, counsel for the defendant took the point (at the close of the plaintiff's case) that there was no evidence of negligence to go to the jury. The judge agreed and stopped the case without calling on the defendant. For this success the counsel was scolded by the Court of Appeal. He was told he had fired too soon. In remitting the case for a fresh trial the Court of Appeal punished the defendant by giving the plaintiff the costs of the appeal and directing that the defendant, even if successful at the re-trial, should not have the costs of the first trial. The Chamber of Commerce report says that dates should always be fixed for trials—a great convenience if only the length of a case can be accurately foreseen. It comments, too, upon the illogical rule by which a junior counsel must receive a brief fee equal to two-thirds of his leader's fee though he would probably be prepared to fight the case single-handed for much less. Professional fees are matters which may in time be adjusted by the laws of supply and demand. It is significant that for many months business in the Temple has been reported to be very slack. The Chamber of Commerce remedies may not all be equally acceptable, but the fact that the inquiry should have been instituted is evidence of grave dissatisfaction with the present conditions of litigation.

MEDICAL SERVICE UNDER NATIONAL HEALTH INSURANCE.

THE report made by Sir ALFRED WATSON, the Government Actuary to the Ministry of Health, after a scrutiny of the sickness and disablement experience in a group of approved societies, is an extremely valuable document, as the comments made upon it at the time of its issue and its subsequent discussion in the House of Commons show very clearly. It forms a review from certain aspects of the administration of the National Health Insurance Act, revealing the facts that, while certain of the benefits promised under the Act could not be said to have materialised, the pecuniary cost of the machinery, already a heavy burden, bade fair to advance to a point at which it would be insupportable. Many questions involved in a discussion of the working of the Act were debated in the House during the past few days, and as one result it became known that the Ministry of Health propose to follow up various lines of investigation, indicated by the facts in the report, and intend to take the public into their confidence at definite intervals. This means alike that the Ministry recognise the imperfections of the Act as definitely requiring amendment or removal, and admit that only with the coöperation of the public can the necessary changes be effected. There is not, either among the public or in the ranks of the medical profession, any serious consensus of opinion that the Act does not represent a large attempt to secure the improvement and maintenance of the national health on some broad contributory scheme—there being no other practicable course; but from all sides the working of the Act has given rise to legitimate criticism since it became the law of the land. The insured population find that the benefits are not administered in a symmetrical way, the contributions exacted being everywhere the same while the benefits accruing vary greatly according to the success and economy of the particular approved society. The doctors admit that the scheme, as far as it goes, has in many directions advanced their material interests, but it has brought under their charge a vast mass of patients for whose treatment they have become responsible when they are often unable to provide the appropriate care, and where always their professional work has to be conducted in accordance with regulations that in individual instances may be vexatious even though they are necessary as part of the extensive scheme. The approved societies are regarding their pecuniary commitments with a steadily increasing apprehension, and would assuredly welcome changes promising to lighten their burdens as stewards; and such changes would be all to the good if resulting economies were not made at the expense either of the insured population or the doctors.

We reported at length last week, under the heading of Parliamentary Intelligence, the debate on the administration of the Act in its early phases; the sequel to the debate will be found in our columns to-day, where the feeling of dissatisfaction, in many regards with the Act, as it is, is reflected in the speeches of all the participants in the discussion. Indeed, no one can read those speeches, delivered from their different angles, without seeing how widespread now is the opinion that the National Health Insurance Act will have to be reformed, though it is not so easy either to anticipate in which direction reform will first be attempted nor to forecast how far any particular additions or modifications will have immediate beneficial influence on its working. The gist of Sir ALFRED WATSON'S report was that the burden of the sick, receiving benefits under the Act, was increasing in a threatening manner, and where the fact was admitted without reserve one of two conclusions was reached in most places where public expression of opinion found vent—namely, that a significant proportion of the national sick list was to be regarded either as the outcome of malingering or as the result of lax certification on the part of the doctors; in a sense this is but one opinion looked at from two points of view, for the pretender to pathological conditions can only make good his claims at the expense of the critical acumen of the doctor. In the House of Commons Dr. H. MORGAN repudiated vigorously the suggestion that the doctors could be accused of manufacturing malingerers in this way, while his words were those of wisdom as far as he viewed the increases of the money spent upon administration being not essentially due to lax certification but rather to a generally imperfect method of looking at the benefits to be expected from the Act. Colonel FREMANTLE followed and quoted a statement made by the chairman of the National Conference of Friendly Societies last November which had similar force, for he affirmed that no scheme, however good, would succeed if it removed the incentive to provide for the future and encouraged all and sundry to look to the State to make provision for that future.

The debate in the House of Commons should prove of real use in helping the legislature to appreciate that the reform of medical service under the National Health Insurance Act is called for on all sides, and that, while there should be no insuperable difficulty in reconciling conflicting interests when the radical faults are faced, there must be a willingness to proceed thoroughly. It is not sufficient to attribute the present situation of the service either to a want of conscientiousness on the part of doctors or to an exhibition of laziness and duplicity on the part of panel patients. Nor is it unreasonable on the part of approved societies to ask for protection through legislation against the risks of disabling expenditure. Many of the cases which are open to criticism as being examples either, on the one hand, of malingering, or, on the other hand, of lax certification may well be exactly those cases where early treatment has been required or where an extension of treatment, when a certain measure of convalescence has been reached, is necessary to firm recovery. The reluctance of the doctor to give a certificate in early stages while a certain capacity for work remains should not require to be excused on the ground that there must be no laxity in certifying, while the greatest factor in the preservation of public health is the early identification and treatment of disease. Nor should patients be too promptly sent back to work in response either to pressure from approved societies or their individual desire to carry on—and medical men do not agree that the insured population show any general desire to remain out of work when capacity to work has been reached. In the long run the funds of the approved societies would benefit from the earlier treatment of a growing proportion of their charges, as well as from increasing relief to their expenditure on recurrent conditions of sickness. These are things which will have to be remembered in that general improvement of medical service of the insured, which must soon be forthcoming, implied in the extension of benefits and of institutional care and the regularised assistance of a specialist consultant service. The position, as far as it is critical, demonstrates that the beneficiaries under the Act are relying upon it with a growing confidence; we have not here a disgruntled people demanding the removal of things that irk, but an intelligent people who see that something good would become something better if the lessons of experience were followed.

TREATMENT OF URETHRAL STRICTURE.

THE subject selected by Mr. JOCELYN SWAN for his paper before the Medical Society for the Study of Venereal Diseases is of considerable interest to all engaged in general practice. Especially important is the cause of urethral strictures, and, as will be seen from the report on p. 1069, Mr. SWAN himself, and some of those who spoke after him, were of opinion that many are produced by over-drastic treatment. The urethral mucous membrane is a delicate structure and it is not surprising that some of the methods formerly in vogue—especially during, and for a few years after, the late war— resulted in its damage and subsequent fibrosis. At that time the great increase in the incidence of gonorrhœa led to desperate efforts to find more efficient methods of treatment. The fact that the gonococcus soon penetrates the lining of the urethra and gets beyond the range of local antiseptics induced experimenters to seek methods of reaching it by means of electrolysis, cauterisation, and penetrating lotions. The immediate result was undoubtedly an increase in traumatic urethritis and a higher incidence of stricture. Fortunately, the pendulum has swung back again and most of these heroic methods have been abandoned. The fact that our chief hope of dealing with the gonococcus lies in preserving the vitality of the tissues has been recognised, and probably we shall see fewer strictures during the next decade. Moreover, the wider use of the urethroscope will undoubtedly lead to an earlier recognition of stricture formation and consequently to prompter treatment. It is the old and neglected stricture that is difficult to dilate. The more adult the fibrous deposit and the greater the submucous fibrosis, the less response follows to the passage of bougies or the use of the Kollman's dilator. If a stricture is recognised before it has materially altered the calibre of the urethra a complete cure may be possible. If it has been left until the passage has become so narrow as to produce an obvious change in the character of the stream no treatment except excision can restore the normal lumen of the tube. The moral to be drawn from Mr. SWAN's paper is, therefore, first that we must make every effort to avoid by over-drastic treatment the formation of strictures, and, second, that by the use of the urethroscope we must learn to detect them at a stage when they are amenable to treatment.

In discussing the treatment of the long-standing stricture Mr. SWAN laid emphasis on the excellent results of internal urethrotomy. The fact that in our hospitals this operation has largely displaced the older measure of external urethrotomy is in itself an indication of an improvement in the general level of treatment. There are few cases, even amongst the neglected, in which the expert fails to pass a filiform bougie, and therefore there are few instances in which a Wheelhouse operation is forced upon the surgeon. Nevertheless, by looking through the operative statistics of general hospitals, institutions are still to be found in which internal urethrotomy is seldom performed, and for this reason Mr. SWAN's insistence on the excellence of the results obtained from the Maisonneuve method is to be welcomed.

Since it is in the hands of the general practitioner that the early recognition of stricture rests, the part he plays in the improvement of its treatment is all-important. The fact that the old and desperate cases that formerly thronged the out-patient departments of our hospitals are nowadays seldom seen is proof that he is beginning to recognise his responsibility.

THE RATING OF HOSPITALS.—The town council of Blyth (Northumberland) has voted to the Knight Memorial Hospital in that town a sum equal to the difference between the old rates and those imposed by the recent reassessment. The Northumberland county council has convened a conference of representatives of the five assessment committees of the county and officials of the local hospitals together with the rating officers, to consider the whole question of hospital rating.

MANCHESTER RADIUM INSTITUTE.—At the annual meeting of the Manchester and District Radium Institute on April 30th it was stated that the waiting-list was "appalling." If all those who were waiting took their turn, it would be three or four months before they could be admitted to the institute. Selection had therefore to be resorted to, and in many cases patients were dead before they could be admitted. There was need for more radium, more staff, and more money. The report for 1929 by the honorary radiologist, Dr. G. E. Birkett, states that the number of patients registered was 1257. Of these, 724 were found to be suitable for treatment, 648 were treated and 76 were still awaiting treatment. During the year the number of in-patients was 324. The limit of hospital patients was now ten; for private patients four. There are four additional beds at the Christie Hospital. Modern technique demands a longer stay in hospital, and the average period is probably four times as long as in 1921.

Annotations.

"Ne quid nimis."

PUBLIC ASSISTANCE COMMITTEES AND THE PRESS.

A DEPUTATION from the Newspaper Society, asking the Minister of Health's aid in asserting the right of the press to be present at meetings of Public Assistance Committees, has met with scant success. The Minister held out no hope of official efforts towards new legislation in the near future, and added that in any case he would have to consult the views of local authorities first. The present situation is perfectly clear. After certain local incidents had given prominence to the need of legislation, the Local Authorities (Admission of the Press to Meetings) Act of 1908 was passed "for the admission of the press to the meetings of certain local authorities." The specified authorities comprised county and county borough councils, borough councils (including those in metropolitan boroughs), urban and rural district and parish councils, boards of guardians, and any other local body having the power to make a rate. Boards of guardians, as is well known, have been abolished by the Local Government Act of last year. References in Statutes to guardians are (by virtue of the table of equivalents in the tenth schedule to the Act) to be construed as references to county and county borough councils. Both the latter bodies were already within the Act of 1908, so that representatives of the press have the right of entry to their meetings. But the new Guardians Committees, or Public Assistance Committees, are not within the 1908 Act either by virtue of specific mention thereinor by virtue of succession or by virtue of being entitled to raise a rate. Thus to extend the 1908 Act to a Public Assistance Committee will require fresh legislation, and no student of the political horizon or of the congested programme of the Government will be surprised to hear that the Minister of Health deprecates further commitments at the moment. There seems little prospect of a private member being able to introduce the necessary Bill in default of official action. There remains, therefore, only the appeal by the local press to the individual committee as a matter of favour. The functions delegated to the committees are wide in scope; further delegation may make them even wider. If the local government electors are to have adequate information of what their representatives are doing, the press should have reasonable access to meetings. The committee could always—as the bodies within the 1908 Act are entitled to do—exclude the reporters by special resolution whenever such a course is deemed desirable.

FURTHER ADVANCES IN THE PATHOLOGY OF PERNICIOUS ANÆMIA.

Two communications from the Thorndike Memorial Laboratory at the Boston City Hospital, which appear on another page, show that many of the problems arising out of the liver treatment of pernicious anæmia, which was initiated in this laboratory, are being tackled with promising results. Dr. W. B. Castle and his collaborators had previously demonstrated that by an interaction of normal human fasting gastric contents and beef muscle, both of which are separately ineffective, a substance is produced which will cause an improvement in pernicious anæmia comparable to that obtained with liver feeding. They have now studied this reaction on 15 additional cases of pernicious anæmia in order to ascertain the nature of (1) the extrinsic factor of the reaction contained in beef muscle, and (2) the intrinsic factor present in normal human gastric contents. They find that the proteins precipitated at pH 6 from beef muscle may act as the extrinsic factor. The nature of the intrinsic factor contained in the normal gastric juice remains unknown. None of the existing tests of gastric function serve to detect it; we know only that it may act in neutral solution and is destroyed by heating, and that it is not hydrochloric acid, pepsin, or rennin. It seems probable that the ingenuity of these workers will shortly devise some means of identifying this elusive factor. Meanwhile Dr. Janet M. Vaughan, and Dr. Gulli Lindh Muller, working with Dr. George R. Minot, the director of the laboratory, have made interesting use of the circumstance that the bone-marrow of the healthy grain-fed pigeon is of the same type as the bone-marrow in humans, pathologically characteristic of pernicious anæmia. The idea occurred to them that the administration to pigeons of substances capable of alleviating a deficiency in man associated with this megaloblastic hyperplasia of the marrow might provoke a response in the bird similar to that resulting in clinical cases. This response, which consists mainly of a rapid increase in the circulating reticulocytes, might then form the basis of a biological test for the potency of these substances. Intravenous injections of liver preparations known to be effective in pernicious anæmia gave a consistent response in 14 healthy birds. Two pigeons failed to react to a potent fraction, possibly because only extremely small doses were given. Negative results were obtained with extracts ineffective in pernicious anæmia and with liver extract in which the active principle has been destroyed. These results are likely to have considerable biological significance, though as yet they are not consistent enough to justify the assumption that a sure test for the potency of liver extracts has been discovered.

THE TAVISTOCK CLINIC.

A YEAR ago the clinic for functional nervous disorders at 51, Tavistock-square, London, believed that it was doing absolutely all the work that was possible in the limited space at its disposal, yet it has continued to expand, chiefly by means of working on Saturday afternoons and up to 10 o'clock at night. It received 625 new cases during the year, and had a total of 918 under treatment. There are now 14 members of the medical staff in regular attendance, and some of them contrive to engage in research as well as treatment. The periodical staff meetings to discuss the work have done much to foster a corporate spirit. In addition to the doctors, there are now two lay workers, a psychologist for mental tests and a specialist in speech defects. At present the speech therapy department, which was only opened last October, is confined to children, but it is shortly to be extended to adults. There has been a considerable increase in the number of probation cases referred to the clinic by the courts, and also of ex-Service cases sent by the various organisations that deal with old soldiers. One of the urgent needs is a better social service, for the funds will at present only allow one paid half-time social worker and, valuable as voluntary help is, it cannot but be irregular; and the time of the physicians is taken up—especially in the children's department—with many investigations which could profitably be relegated to a visitor. This department has increased its work by one-third during the year, and the children are brought earlier than they used to be; nevertheless the belief that a child will grow out of its difficulties is still the cause of much waste of valuable time. The experience of the physicians here is that the child far more often grows into them or into worse ones. A Margaret Morris class was started in April, and has proved a useful part of treatment, while other interesting therapeutic measures include fencing and groups for painting and artistic expression. The long-desired hostel was opened in September, and has room for 14 patients. It is run on communal

lines, every inmate helping in the work of the house. A weekly fee of £2 12s. includes residence and treatment at the clinic, as well as the benefit of occupational classes twice weekly. The clinic has worked during the past year in coöperation with the National Council for Mental Hygiene, as well as with other kindred organisations, and combined efforts have done much to help the financial situation. Nevertheless, there is a deficit of nearly £500 on the year's accounts, and an additional £1000 in annual subscriptions is needed to place the work on a satisfactory basis. That it is a work appreciated and needed is shown by the fact that the waiting-list has had to be closed owing to the number of applicants, and that there is at the present time an unofficial list of some 250 people waiting to be put on the waiting-list as soon as it is reopened.

FLUCTUATIONS IN VENEREAL DISEASE.

IN this self-satisfied age we may think that such phrases as "genius epidemicus" are an anachronism, but it seems doubtful whether the factors governing the rise and fall of the venereal diseases can even now be given any more accurate description than "mysterious." The encouraging reports quoted in our issue of April 26th (p. 927) are somewhat discounted by the story of the behaviour of these diseases in Helsingfors and in all Finland, which Dr. N. E. Wilén contributes to the February number of *Finska Läkaresällskapets Handlingar*. The curves for syphilis, gonorrhœa, and ulcus molle during the last two decades have been on the whole parallel, he says, and thus far it is evident that they have followed some common law. But while measures directly devised for combating these diseases seem to have influenced them but little, social upheavals of various kinds apparently played a comparatively important part. The years 1900, 1912, and 1923 showed the lowest dips in the incidence of the venereal diseases grouped as a whole; they amounted to 7·2 per thousand inhabitants in the first year, to 12·2 in 1912, and to 14·6 in 1923. The highest peaks were observed in 1905, 1917, and 1927, the corresponding figures being 23·3, 27·8 and 26·7 respectively. The Russianising of the Finnish police force in the period 1900–05, and the great strike of 1905 corresponded with high rates. The regulation of prostitution was abolished on May 16th, 1907, but the marked decline in the incidence of all the venereal diseases about this time was demonstrable from 1905 to 1910—i.e., it occurred before as well as after this event. With regard to the possibility of salvarsan and allied drugs influencing the syphilis rate, it should be noted that it was not till after the late war that these drugs were extensively used in Helsingfors. In 1910, the year when salvarsan was introduced, there were 12 new cases of syphilis per 10,000 inhabitants in the capital. This figure rose considerably during the following years, attaining a peak of 54 in 1919. From this year till 1923 there was a remarkable decline, the number of new cases being reduced in the last-named year to 16. Since then, however, there has been an almost unbroken rise, the corresponding figure for 1929 being 29. Hence Dr. Wilén's conclusion that "it would therefore seem that salvarsan treatment is unable to counteract the periodic increase in the incidence of this disease to the extent hoped for." His study of the incidence of syphilis in Stockholm before and after the Swedish law (Jan. 1st, 1919) against venereal disease shows that while there were only 32 new cases of syphilis for every 10,000 inhabitants in 1918, this figure rose to 40 for 1919. It is true that the following years showed a marked decline, and in 1925 there were only five new cases in Stockholm per 10,000 inhabitants. In 1927, however, this figure jumped to 12. What is still more remarkable is that, during these post-war years, the syphilis curves of Helsingfors and Stockholm ran parallel to a striking degree, although the venereal disease legislation of Sweden was not paralleled in Finland. Dr. Wilén concludes that his Scandinavian studies give a certain degree of support to the thesis of Buschke, Gumpert, and Langer, who in 1927 in the *Münchener medizinische Wochenschrift* expressed doubts about the modern treatment of syphilis being the chief factor in its periodic decline. These writers consider that the incidence of the venereal diseases is mainly determined by economic and social factors, and that the explanation for the fluctuations in their frequency is to be found (or hidden) in the term "genius epidemicus."

THE PSYCHOLOGY OF THE BLIND.

BEFORE the nineteenth century the blind in all countries necessarily led isolated lives, and only those specially favoured by circumstances could manage by prodigious efforts to develop their faculties. Most people still find it hard to realise that a person blind from infancy, if only he is given the opportunity to develop those other senses which are relatively unimportant to the sighted, can acquire a consciousness of the world in which he lives very little inferior to that of the sighted person. This result, however, can only be attained by appropriate training, which can be bestowed on blind pupils collected in a school, but hardly on the isolated blind child. The movement for the amelioration of the condition of the blind really started in 1784, with the establishment in Paris of the first school ever known for blind children by Valentin Haüy. The movement has continued to gain momentum up to our own day, when the State—more especially in England—has taken the blind under its special protection. Of this movement the Blind Persons Act of 1920, a measure aiming at the organisation of voluntary effort throughout the country and its supplement by monetary aid from the State, probably marks the climax. Two books recently published[1] give a clear account of the problems involved in the care and education of the blind and of the psychological aspects of their development. Mr. Ritchie, who gives his principal attention to the history of the movement for the betterment of the blind, is also concerned with their mental processes. His last three chapters provide an excellent summary of the consequences involved by the absence of the sense of sight on the mental content, behaviour, and character. Prof. Villey, who provides a psychological study of great value, complains that the blind are still victims of the ignorance of the public concerning their real position in the community. An excuse for this ignorance is that in some cases blindness is only part of a diseased condition of the body that involves mental defect, but mostly this is not so. The deprivation of a single sense, even the most important one, need not, by itself, render the blind man either intellectually or morally inferior to his sighted neighbours. In reading the history of the educational facilities offered to the blind the paramount importance of the invention of the Braille alphabet becomes obvious. Mr. Ritchie describes its struggle and final victory over competing systems, practically the only other survivor of these being the Moon system, which, being easier to learn, is more adapted to the use of those who become blind late in life. The Braille alphabet, unlike its predecessors, abandoned any pretence of making the embossed letters adapted to the sense of touch resemble the letters adapted to the sense of sight. Full advantage is taken of the extreme sensitiveness of the finger-tips, and its success is largely due to this fact. The National Library is now a varied collection, showing not only wise discrimination but a wide catholicity of choice. In the year ended in March, 1929, the number of

[1] The World of the Blind. A psychological study by Pierre Villey, Professor of Literature, Caen University. Translated by Alys Hallard. London: G. Duckworth and Co., Ltd. 1930. Pp. 403. 7s. 6d.—Concerning the Blind. Being a historical sketch of organised effort on behalf of the blind of Great Britain, and some thoughts concerning the mental life of a person born blind. By J. M. Ritchie, M.A., Ph.D. London: Oliver and Boyd. 1930. Pp. 235. 7s. 6d.

volumes circulated reached the huge total of 231,000.

To account for the great facility with which many of the educated blind go about their ordinary work or play many people, including even psychologists, have supposed that their surviving senses are more acute than those of other people; this explanation has been applied especially to the deaf-blind. Modern investigations, however, disprove the assumption on which it rests. The minimum excitation necessary for provoking a tactile or auditive sensation is not less for a blind person than for one who sees. It is in the way that these sensations are interpreted by the blind that the superiority of the latter consists. Similarly, the shepherd and the townsman may each possess normal sight, but while the shepherd can distinguish each of his sheep individually, to the townsman they appear all alike. Both books deal with the various implications of the substitution of one sense for another. The "sense of obstacles," a faculty possessed by many of the blind which makes them conscious of obstacles in their path, has been the subject of much controversy. Monsieur Villey attributes it to the sense of hearing, whereas Mr. Ritchie holds that although the ear may take a leading part in this appreciation of obstacles, it acts rather as an organ for the detection of pressure than as a vehicle for sound. An interesting psychological problem discussed in both books concerns the conception of space possessed by the blind. To the ordinary man it is difficult to understand how a person born blind can have mental images of objects at all resembling those of the sighted person. The fact is that their images are not unlike, but are reached by a different method of interpretation. Visual images without mental analysis do not tell one much, as is illustrated by the mistakes made at first by a patient with congenital cataract who obtains sight by operation in adult life. The sense of touch is an alternative channel to that of sight, and when interpreted by mental processes may result in conception of the outside world, not perhaps as complete as that of the sighted, but still of the same order. All this is worked out at considerable length by Monsieur Villey, and more tersely by Mr. Ritchie, who discusses the extent to which the limitations of the blind in this connexion affect character. These considerations have a most practical bearing on the education of the blind, in which Mr. Ritchie has himself been engaged for many years. His final chapter in his book should appeal to all who have to do with the blind in any capacity, even those who would use them as characters in fiction.

SLEEPING IN UNDERGROUND ROOMS.

THE use of underground rooms for sleeping purposes in London is subject to compliance with the provisions of the Public Health (London) Act, 1891, the Housing Act, 1925, and especially the regulations made by local authorities under the latter Act. In Holborn there recently has been occasion to consider questions relating to the construction of underground rooms. Plans for new buildings have to be submitted to the London County Council for approval under the London Building Act and to the local authority for approval so far as drainage work is concerned. For the latter purpose plans were submitted in connexion with a block of flats proposed to be constructed in the borough. The plans disclosed an intention to construct underground sleeping rooms. It appeared that the rooms if constructed as shown on the plans would not comply with the regulations, and use of these for sleeping would have called for action to prevent illegal occupation. It seems a weakness in public health law that no municipal authority has power to prevent the construction of underground rooms which would not be in compliance with the regulations when used as sleeping rooms. It is true that on occupation of the rooms the local authority could take steps to deal with the matter by way of closing order, but such a course in the case of newly erected dwellings would, to say the least of it, be inconvenient for the tenant who had moved in in all good faith, uneconomical for the owner who might be faced with the loss of rent or considerable outlay for reconstruction, and harsh on the part of the local authority making a closing order for part of newly erected premises. In the particular case in question after correspondence and interviews the plans were amended and the underground rooms brought into conformity with the requirements. The absence, however, of any statutory power to prevent such rooms being newly constructed led the borough housing committee to express the view that architects and others proposing to construct basement rooms in connexion with new buildings should be required to submit for the approval of the local authority complete plans with appropriate specification and a declaration that the underground rooms proposed to be built would comply with all enactments dealing with the use of basement rooms. If the construction of such rooms cannot be entirely prevented it is not unreasonable to seek powers to ensure that when completed they will comply with the minimum requirements for living purposes. The borough council agreed with the views expressed by their housing committee and adopted a resolution, copies of which were sent to the Minister of Health and to the larger borough councils asking them to take similar action. Up to the present replies have been received, we understand, from 31 authorities; 25 supported the Holborn resolution, 6 disagreed or decided to take no action.

THE SURGICAL TREATMENT OF HYPERINSULINISM.

HYPERINSULINISM is now recognised in America as a definite clinical entity, the antithesis to diabetes, as hyperthyroidism is to myxœdema, gigantism to pituitary ateliosis, and osteitis fibrosa diffusa to parathyroid tetany. Clinically the symptoms are those of an overdose of insulin, notably intense muscular weakness and exhaustion, which can only be controlled by repeated resort to carbohydrate food. In extreme cases there may be convulsive seizures and the patient may die in hypoglycæmic coma. In this country no such fatal cases of what may be termed idiopathic hypoglycæmia have so far been recorded; yet they must occur from time to time, and are probably erroneously regarded as epilepsy. Pathologically an adenomatous or carcinomatous hyperplasia of the islets of Langerhans is usually found, either in the form of a localised tumour, or more commonly diffused throughout the pancreas. The possibility of treating the condition by resection of portions of the pancreas has already been explored by American surgeons, and their results up to date have been reviewed by F. N. Allan, W. C. Boeck, and E. S. Judd.[1] In those cases in which the hyperplastic tissue is in the form of a localised tumour the operation is relatively simple, and in the only case of hyperinsulinism which has so far been completely cured by operation such a tumour was found and excised. The more common type of diffuse hyperplasia, however, is less easy to deal with, for, as in the surgical treatment of exophthalmic goitre, the operator can only guess how much tissue should be removed. If a comparatively small portion of pancreatic tissue is excised the patient's symptoms will not be relieved, while, on the other hand, too radical resection may cause diabetes. Up to the present, the surgeon has erred on the side of conservatism and the results, from the point of view of the patient, have not been strikingly successful. The operative difficulties are considerable. It is necessary to remove the tail of the pancreas completely, since it contains the bulk of the islet tissue, and in this region hæmorrhage, especially from the splenic vessels, may be difficult

[1] Jour. Amer. Med. Assoc., April 12th, p. 1116.

to control; so much so that removal of spleen and pancreas en bloc has been advocated. In spite of these technical difficulties, however, partial resection of the pancreas can now be regarded as a relatively safe and simple operation, which is justified in those severe cases of hyperinsulinism which do not respond to dietetic treatment.

THE MARGATE PUBLIC HEALTH CONGRESS.

THE annual congress of the Royal Sanitary Institute will be held during the last week of June in Margate, under the presidency of Lord Cornwallis, Chairman of the Kent County Council. Among the subjects chosen for discussion are maternal mortality, the training of midwives, health visiting in rural areas, the health of industrial workers, food in relation to dental hygiene, the regional control of sewage works, and psittacosis. Dr. O. Charnock Bradley, Principal of the Royal (Dick) Veterinary College, Edinburgh, will lecture on Diseases of Domestic Animals from the Human Angle. Delegates are expected from South Australia, New South Wales, Victoria, Punjab, Bombay, Karachi, United Provinces (India), Capetown, Port Elizabeth, Pretoria, Lagos, Ontario, Nova Scotia, Singapore, Egypt, Denmark, Greece, Luxembourg, Mexico, Persia, Poland, and Bordeaux. A special feature this year is the visit of 200 representatives of the American Public Health Association. An exhibition of appliances for the promotion of public health and sanitation has been arranged; this will include infant and invalid foods, household and kitchen appliances, filters, water softeners, sewage disposal apparatus, refrigerators, gas stoves and fittings, stoves and ranges, disinfectants, soap, and sanitary appliances. Sir Andrew Balfour will preside over the section on Preventive Medicine; Sir John Moore over that on Veterinary Hygiene; Lady Howard de Walden over that on Maternity and Child Welfare and School Hygiene; and Miss Gertrude Tuckwell over that on Personal and Domestic Hygiene.

BROKEN HYPODERMIC NEEDLES.

DURING the past few years the London and Counties Medical Protection Society has had many applications from members for advice and assistance in cases of hypodermic needles breaking during the administration of local anæsthetics, and claims for damages for negligence are often subsequently made. In view of this the Council of the Society, after consulting with expert metallurgists, thinks it desirable that recommendations concerning the use of hypodermic needles should be circulated so as to lessen the incidence of this accident, or, should it occur, to give good ground for successfully contesting any claims arising therefrom. It is very difficult to detect a flaw (apart from too hard tempering) in any given needle, and in order to collect useful evidence on this matter the Society makes certain recommendations: A new needle should be used for every case. Needles should never be flamed in order to sterilise them, as the temper may be profoundly altered by this action and the needle rendered very brittle. Since needles nearly always break at the point of entry into the holder, a short holder should be used, so that if fracture should occur at this point a large portion of needle will remain in the tissues and so be the more readily found and removed. Needles should not be kept in watery sterilising solutions as, unless they are of stainless steel, they may be corroded and weakened, even though such damage may not be visible to the naked eye. When a needle does fracture the Society asks to be advised immediately whether a claim is made or not. In such cases the make of the needle should be given, and when possible both portions of the broken needle should be sent to the secretary of the Society. Any untoward experiences obtained in practice with any make of needle should be given. In the event of more than one breakage, not only should the two portions of the broken needles be forwarded, but also the remaining contents of that tube of needles. Owing to the difficulty of tempering so small an article as a carbon steel needle to the exact degree required, the Society considers that an unnecessary risk is being taken in using them. Better and more constant results are obtainable from needles made of alloy (such as stainless steel) which are, generally speaking, far more flexible than those made of carbon steel.

THE LATE MR. WHEATLEY.

Mr. John Wheatley, M.P., who died on Monday night, succeeded Mr. Neville Chamberlain as Minister of Health during the Labour Government of 1924. His tenure of office was perhaps too short to prove administrative ability, but it was long enough to justify an appointment which had caused anxiety. Both on the Glasgow Town Council and in the House of Commons Wheatley was known as an uncompromising advocate of Socialist experiment, and the Ministry of Health seemed to be fertile ground. But in treating the housing problem, with which his name was to be chiefly associated, he did not interfere with the plans which Mr. Chamberlain had made for helping private enterprise. The main object of his Housing Act was to supplement previous measures rather than supersede them, but with an enlarged subsidy to local authorities and private enterprise he hoped to provide 2,500,000 working-class houses within 15 years. No further opportunity of framing legislation was given him, for after leaving office he became increasingly critical of Mr. MacDonald's leadership and as an irreconcilable member of the left wing he could have no place in the present Government.

It will be recalled that on the formation of the Ministry of Health in 1920 Dr. Christopher Addison was the first to take office. He was followed, in 1921, by Sir Alfred Mond, who gave place, for a few months, to Sir Arthur Griffith-Boscawen. Early in 1923 Mr. Neville Chamberlain began the term of office which lasted—with Mr. Wheatley's intermission—until last summer. He was then succeeded by the present Minister, Mr. Arthur Greenwood.

BRITISH EMPIRE RED CROSS CONFERENCE.

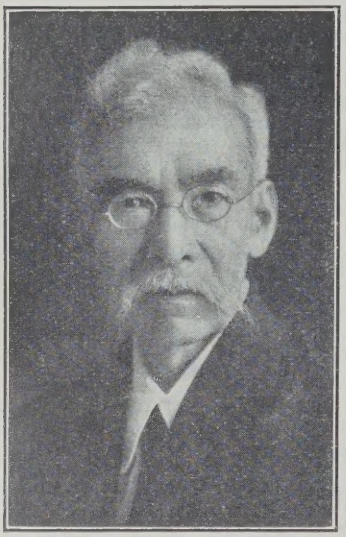
"To encourage and promote in every country in the world the establishment and development of a duly authorised voluntary national Red Cross Organisation, having as purposes the improvement of health, the prevention of disease, and the mitigation of suffering throughout the world, and to secure the coöperation of such organisations for these purposes."

The programme of the conference which opens in London on Monday next, May 19th, explains its purpose by the extract (printed above) from Article XXV. of the Covenant of the League of Nations. The first session will be held at St. James's Palace when the Duke of York will welcome the delegates, and addresses will be given (among others) by Lord Passfield, Sir Arthur Stanley, Dr. J. L. Biggar of the Canadian Red Cross Society, and Major-General Sir H. Symons, I.M.S., of the Indian Red Cross Society. On Monday evening a banquet will be given to the overseas delegates at the May Fair Hotel. On Tuesday morning the first plenary meeting will receive reports and nominate subcommittees, while in the afternoon addresses will be delivered on Methods and Opportunities of Red Cross Coöperation by Mr. Thomas Shaw, Secretary of State for War, Mr. Arthur Greenwood, Minister of Health, and others. On Wednesday H.M. the Queen will receive the delegates at Buckingham Palace in the morning and in the afternoon the conference will divide into subcommittees to discuss (1) Training and Organisation of Detachments; (2) Improvement of Health and Mitigation of Suffering; (3) Junior Red Cross; (4) General Red

Cross Organisation. On Thursday afternoon there will be a meeting of County Directors with Sir Arthur Stanley in the chair. On Friday the final plenary meeting will receive reports and adopt resolutions; to be followed by luncheon at the Mansion House and a reception at the College of Nursing. On Saturday afternoon Princess Mary will inspect detachments at Hatfield House. During the week will be thrown open to delegates such places of interest as the British Red Cross Clinic at Peto-place, the Star and Garter Home at Richmond, Surrey, the camp at Osborne, I.O.W. for women V.A.D. members, the Red Cross Hostel for International Students at 15, Manchester-square, and the Joint Red Cross Hospital Library at 48, Queen's-gardens, Lancaster Gate.

KATSUSABURO YAMAGIWA.

THE death of Prof. Yamagiwa, of Tokyo, removes a pioneer from the world of cancer research. Born in 1863, he studied medicine at Tokyo Imperial University, graduating in 1888. In 1891 he was appointed assistant professor of the University, but was given a Government grant for a period of study leave in Germany, where he stayed until 1894. On his return he was promoted to a full professorship and assigned to the department of pathology and pathological anatomy. He held this post until his retirement in 1923, when the University made him Emeritus Professor. He was elected to the Imperial Academy in 1919, when he received the Academy prize. Yamagiwa made many important contributions to pathology, but the work which brought him world-wide fame was his demonstration in 1915 that in experimental animals cancer could be produced by the application of coal-tar to the skin over prolonged periods. This was no chance observation, but the outcome of long years of work devoted to surmounting the difficulties of proving that chronic irritation may cause cancer. Holding that continued traumas of various kinds capable of stimulating epithelial growth would lead eventually to the development of cancer, he realised the importance of Fibiger's demonstration, published in 1913, that cancer could be produced at will in the stomach of rats by feeding the animals with a certain worm (*gongylonema*). "Encouraged," Yamagiwa writes in the introduction, "by the glorious achievement of Fibiger"—and rarely has a scientific worker paid a more generous tribute to another—he began with Ichikawa a series of experiments in which they applied different traumas to the ear of rabbits. They succeeded eventually in producing cancer by long-continued painting with tar, and in this way inaugurated a new era in experimental cancer research. Prof. Yamagiwa founded in 1906 a journal devoted exclusively to cancer research, under the title of *Gann*. This periodical has since become the official organ of the Japanese Society of Cancer Research, whose president, Dr. Mataro Nagayo, contributes to the current issue a fine appreciation of the founder.



A COURSE IN ALLERGY.

A post-graduate course in allergic disorders will be held at the Pharmaco-therapeutic Institute at Leiden, from June 10th to 12th, when lectures and demonstrations will be given by Prof. W. Storm van Leeuwen, Prof. G. A. Rost of Freiburg i/Br., Dr. Dekker of Spa Wald, Rheinland, and J. van Niekerk, Conservator of the Institute. Lectures and demonstrations will be given in German, and will include the general conception of allergy, the significance of skin reactions, the preparation of extracts, the inspection of allergen-free installations in private houses, the relation of asthma to climate, the treatment of hay-fever and asthma in general practice, and the social significance of allergens in relation to the prevention of tuberculosis and asthma. The fee for the course is 30 marks, remitted to young assistants. Advice and information as to lodgings may be obtained from Frl. van der Waals, Pharmaco-therapeutic Institute, Leiden, Holland.

FRIDTJOF NANSEN.

IN an age of memorable exploits, the expeditions of Fridtjof Nansen in the Arctic have remained outstanding. But the life just ended was twice remarkable; for the far-sighted organiser of exploration was able to turn his gifts to the great advantage of European goodwill. His career was an unusual mixture of the scientific and the political. In 1887, just before his expedition across Greenland, he wrote a treatise on the Structure and Combination of the Histological Elements of the Central Nervous System. In 1906, after taking an active part in the separation of Norway from Sweden, he left the chair of Zoology at Christiania to serve as the first Norwegian Minister in London; and in 1919 he once again transferred his main attention from the problems of science to those of mankind. At this time the Council of Four were wondering how to deal with Soviet Russia, and Nansen proposed a scheme of famine relief which was accepted in principle but unfortunately abandoned. The League of Nations, however, entrusted him with the task of repatriating prisoners of war, and the success of this work led to his becoming High Commissioner for Refugees. As an internationalist he demanded more altruism from governments than they were capable of, but in the suspicious atmosphere of post-war Europe his labours for the settlement of refugees have had an important influence. This was appropriately recognised by the award of the Nobel Peace Prize in 1921, while his reputation in this country was reflected in his election, four years later, as Lord Rector of St. Andrew's University.

Mr. Thomas Peel Dunhill, assistant surgeon to St. Bartholomew's Hospital, has been appointed an honorary surgeon to the King in succession to the late Sir Alfred Fripp. Mr. Albert James Walton, surgeon to the London Hospital, has been appointed to take Mr. Dunhill's place as surgeon to His Majesty's household.

MATERNITY HOSPITALS.—In his report for 1929, Dr. W. H. F. Oxley, hon. visiting medical officer of the East End Maternity Hospital, Commercial-road, refers to the "serious diminution" in the number of out-patients, and explains it by the growing demand from women to have their babies in hospital. During the year 1920 patients were received into the institution or attended in their own homes.—Last year the Clapham Maternity Hospital, which is entirely under medical women, had what is stated to be the lowest mortality in England—one in 1275. There were 897 in-patients and 443 out-patients.—The annual report of the Jewish Maternity Home, in Underwood-street, Whitechapel, records the creation of a pathological laboratory for research into the causes and prevention of maternal mortality. There were 720 in-patients, and there was a considerable increase in the number of cases attended by the maternity nurses.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LXXII.—THE SIGNIFICANCE OF BLOOD CHOLESTEROL.

CHOLESTEROL exists in the body in two forms, as the so-called free form and also in combination with higher fatty acids as esters. These two forms are not equally distributed; in the brain and in the red blood corpuscles there is free cholesterol only, in bile the cholesterol is largely in the free form but in all other organs, including the blood plasma, the cholesterol is present in both forms, the ester generally in somewhat greater quantity than the free form. In blood the cholesterol content of the red blood corpuscles appears to be practically constant in both health and disease. For this reason it is essential that all estimations of blood cholesterol should be done on plasma (or serum) so that changes in the cholesterol level of the plasma should not be masked by the constant mass of corpuscular cholesterol, and also so that the interpretation of blood cholesterol values should not be complicated by the presence of anæmia.

Method of Estimation.

Cholesterol and its esters are insoluble in water and are carried in the plasma in close association with the proteins, particularly with the euglobulin. Even when hypercholesterolæmia is present the plasma is not necessarily opalescent. The method of estimation of cholesterol is of great importance. Methods which only determine the value of the total cholesterol of either plasma or whole blood are of very limited value. There are a variety of colorimetric methods of estimation in which both forms of cholesterol are determined, the main advantages of which are the ease and rapidity of performance and the small quantity of blood required. The alternative method of estimation is a gravimetric one, using digitonin. This method has a high degree of accuracy but is technically more difficult and requires 15–20 c.cm. of whole blood for each determination. Its reliability is accepted, whereas the colorimetric methods are apt to be vitiated by a variety of inaccuracies. Nevertheless, results of comparative value can be obtained, provided rigidly comparable conditions are adopted. In this article only those results will be discussed which have been verified by the digitonin method of analysis and which can be compared with the normal range of values determined by this method.

It is important to realise at the outset that in health the range of plasma cholesterol values is considerable. The following figures are the result of examination of about fifty normal individuals of both sexes. The figures represent grammes of cholesterol per 100 grammes of plasma.

Grammes of Cholesterol per 100 grammes of Plasma.

—	Total cholesterol.		Free cholesterol.		Ester cholesterol.	
	Average.	Limits of variation.	Average.	Limits of variation.	Average.	Limits of variation.
M.	0·170	0·11–0·22	0·05	0·005–0·082	0·12	0·08–0·14
F.	0·153	0·08–0·23	0·054	0·02–0·094	0·10	0·054–0·14

M. = male; F. = female.

It will be seen at once how wide is the range of normal values, but in general the actual level of plasma cholesterol in a single individual is more constant. The ratio of ester cholesterol to total cholesterol in the plasma is in the majority of cases between 60 and 70 per cent. In normal individuals unexplained variations may occur in this ratio, but though very low values of free cholesterol may be observed, such low values have not been noted as regards the ester form.

Effect of Diet.

During health the level of the plasma cholesterol may be altered by feeding. As a result of a single meal, certain changes ensue which are not of the nature of an alimentary hypercholesterolæmia, as ordinarily understood, but which may consist sometimes in an increase, and sometimes a decrease, compared with fasting values and sometimes in a considerable alteration of the ester to total ratio, in either direction, apparently independent of the type of the meal. There is consequently no obvious relation between the amount of cholesterol ingested and the cholesterol level of the plasma during digestion, and the changes which occur in the plasma are considered as evidence of an active endogenous metabolism in which cholesterol takes a part. It follows that in studying the variations of plasma cholesterol in health it is necessary to take the blood with the patient in the fasting condition, as for example before breakfast. The level of the cholesterol content of the plasma, taken while fasting, can be raised or lowered by sufficiently prolonged feeding with diets of high or low cholesterol content. Such changes are most marked as regards the cholesterol in ester form; the free cholesterol remains practically constant.

Pregnancy.

Apart from the changes just mentioned, the only physiological condition in which the plasma cholesterol level is altered is in pregnancy. In this condition, from about the twentieth week, the free cholesterol increases to a maximum which it reaches about the thirtieth week and concurrently the ester cholesterol falls to a minimum. From this time the amount of free cholesterol decreases and the ester increases till an almost normal ratio of free and ester cholesterol is attained before or near parturition. The plasma cholesterol values generally become quite normal in the first or second week of the puerperium. A few cases only show such an increase of total cholesterol as may be considered hypercholesterolæmia, but the free cholesterol alone sometimes reaches a maximum of about 0·25 per cent. These changes form a very characteristic picture but so far they have not been explained.

Cholesterol Level in Certain Pathological Conditions.

At various times hyper- or hypo-cholesterolæmia has been stated to occur in a large variety of disease states, but in many cases the changes noted have been within the limits of normal variations. Hypocholesterolæmia does occur, at the height of the fever only, in a variety of febrile and infective conditions, but the clinical significance of this is not understood. In this connexion it might be noted here that the degree of hypocholesterolæmia found in cases of enlarged prostate with infection of the urinary tract has been suggested as a test of the operative risk of such cases, but the value of this has not been confirmed. True hypercholesterolæmia occurs in certain types of nephritis, hypothyroidism, biliary stasis, and diabetes.

Nephritis.—Hypercholesterolæmia is a frequent occurrence in nephritis and is present in all those cases which possess the "nephrotic" syndrome, marked by *diffuse* parenchymatous degeneration, heavy albuminuria, changes in the plasma proteins, and where œdema is the chief symptom. Consequently, increases of plasma cholesterol are found in those cases of acute nephritis of prolonged duration, where albuminuria is persistent and hæmaturia absent, and in all that group of chronic nephritis which includes, at one end of the scale, the so-called

pure "nephrosis": and, at the other end, cases of parenchymatous nephritis in which the initial "nephrosis" is more or less rapidly followed by sclerosis and contraction of the kidney. The hypercholesterolæmia may reach as much as 1·0 per cent. of total cholesterol in the plasma, and the ester to total ratio may assume abnormal values in either direction. The cholesterol increase is present throughout the course of these cases of nephritis so long as there is any *tendency* to œdema and it persists in cases of subacute parenchymatous nephritis for long periods even though, as frequently occurs, œdema is temporarily absent. In these cases recovery is rare and after a period of months or years, if infective conditions have not led to a fatal result, the tendency to œdema is replaced by the tendency to vascular changes, increase of blood pressure, and signs of nitrogen retention, and at about the same time the hypercholesterolæmia diminishes. To use, for simplicity, an old terminology, when a large white kidney contracts to a small white kidney the plasma cholesterol becomes normal, but in these cases there may be some overlapping of the characteristics of the two stages and hypercholesterolæmia may still be present when the vascular changes and threatening uræmia herald the termination of the disease. Estimation of plasma cholesterol aids diagnosis in those cases of contracted kidney where no history can be obtained of the previously occurring stages, for if hypercholesterolæmia is found the renal lesion must be a sclerosis secondary to a diffuse nephritis, which was not recognised because the sum of the factors which usually produces the œdema in these cases had not reached a sufficient value. Hypercholesterolæmia is not found in cases of interstitial nephritis or in arterio-sclerotic kidney, or in arterio-sclerosis. The presence of hypercholesterolæmia generally signifies a grave prognosis. The cause of the hypercholesterolæmia is not known, but is possibly related to the disturbance of the plasma proteins which results from the proteinuria. The kidney does excrete traces of cholesterol in the urine, but even in "nephrosis," where the excretion is much increased, the amount does not exceed 40 to 50 mg. per day.

Myxœdema.—The total cholesterol of the plasma in this condition may be increased by nearly 50 per cent. over normal values, and after administration of thyroid gland the values generally become normal. Epstein and Lande thought that blood cholesterol was inversely proportional to the basal metabolic rate and they found an analogy between myxœdema and pure "nephrosis," where the basal metabolic rate is also below normal; this argument was then used to explain the occasional beneficial results of thyroid medication in "nephrosis." However, this relationship of basal metabolic rate and blood cholesterol does not exist in states of hyperthyroidism where, as in exophthalmic goitre, the blood cholesterol is within normal limits.

Biliary Stasis.—Hypercholesterolæmia has been stated to occur in cholelithiasis and in affections of the liver, but there can be little doubt that in all the earlier investigations the hypercholesterolæmia noted was due to the biliary stasis and not to the pathological condition which preceded this. Hypercholesterolæmia is not a feature of uncomplicated cholelithiasis. When, however, biliary stasis occurs, as for examples from impaction of a stone in the common bile-duct or from catarrhal jaundice, the blood picture shows interesting changes. In the early stages the cholesterol ester rapidly diminishes and may almost disappear from the blood plasma, while the free cholesterol may remain normal or show slight increase. This characteristic change in the plasma cholesterol can also be observed in those cases of cholecystostomy where none of the bile is reaching the intestine. This change consequently must be due to the disturbance of fat and cholesterol absorption from the intestine which results from the absence of the bile. If *complete* biliary obstruction persists for many weeks then the plasma cholesterol steadily increases as regards both forms till marked hypercholesterolæmia occurs, but the ester to total ratio remains low, averaging 30 to 40 per cent. If the biliary obstruction is not quite complete or is intermittent the hypercholesterolæmia does not appear. It is usually considered that the increase of plasma cholesterol is due to the retention of biliary cholesterol, but this explanation is by no means satisfactory. To explain this hypercholesterolæmia no hypothesis would be acceptable which ignored the very close chemical relationship of the bile acids and cholesterol.

Diabetes.—True hypercholesterolæmia occasionally occurs in severe cases of diabetes. It is stated that plasma cholesterol determinations are of value in diabetes as an index of prognosis, and that if the hypercholesterolæmia persists despite insulin treatment the prognosis tends to be more serious in the sense that treatment is more difficult. The increase of plasma cholesterol in diabetes mellitus is possibly due to the disturbance of fat metabolism and transport. Hypercholesterolæmia in diabetes (and also in biliary obstruction) may lead to deposition of cholesterol in the skin as xanthoma.

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F.R.C.P. Lond.,
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Public Health Services.

NATIONAL HEALTH INSURANCE IN SCOTLAND.

THE serious effect of the present industrial depression in health insurance finance is the subject of comment in the first annual report just issued (Cmd. 3529) of the Scottish Department of Health. In 1929 the numbers insured under the Unemployment Insurance Acts had only increased by 0·16 per cent. over those in 1927, contrasting with an increase of 4·76 per cent. in the Midlands and North of England. Reduction in the iron and steel, and coal-mining industries was mainly due to migration, but lack of new entrants was an increasing factor. Juvenile unemployment was rife. Of the 1,837,000 members of approved societies in Scotland, 43 per cent. were insured in industrial assurance companies, 48 per cent. in friendly societies, and only 7·4 per cent in trade-union societies. The total membership of the new insurance section among deposit contributors was only 341.

The work of departmental inspectors continues to increase. Establishments visited numbered 25,644, and arrears collected amounted to £11,951 for health insurance and £12,836 for unemployment insurance. A feature of contribution irregularity in recent years has been the prevalence of illegal use of stamps. Prosecutions for this class of offence resulted in 25 convictions, with fines amounting in all to £158, and one term of six months' imprisonment. The judicial decision of questions of employment under the Act has often proved difficult. Of 70 cases submitted during the year, no fewer than 37 were pension cases in relation to past employment. Many cases turned on the question of an existing contract of service. Sixty-four disputes between societies and their members were referred to the Department: 22 were decided in favour of the member, 21 in favour of the society, and ten were withdrawn.

About 2000 practitioners and 1400 chemists are under contract with insurance committees. During the year there were 21 complaints against practitioners but no question arose of the removal of a doctor or chemist from the panel lists. The Department had to deal with seven appeals only against decisions of insurance committees in complaints against doctors and chemists. The complaints against chemists arose out of the operation of the drug-testing schemes.

During 1929, 598 samples were tested, 49 were reported to committees, and a censure or fine was imposed in 16 cases. Surcharges amounting to £209 were made against practitioners for excessive prescribing.

The cost of insurance committees was £50,068; medical benefit cost £792,000; the mileage fund was £42,500, and special grants to necessitous areas and for post-graduate work amounted to £3110. A great effort is being made in Scotland to bring the regional medical officers of the Department into closer relationship with the practitioners. Both for purposes of second opinion and help in diagnosis, and for advice on questions of certification, these consultations are being encouraged. The state of the Drug Fund, which is estimated as amounting to 23·8*d.* per insured person, has shown the need for constant supervision of prescribing. Insulin was supplied to 1115 persons, and its cost amounts to about 4 per cent. of the Drug Fund.

The new Local Government Act is expected to increase the hospital provision for insured persons. The figures given for expenditure in benefits show that the combined cost of sickness and disablement benefits has risen in all classes. The increase in expenditure in 1929, with that in 1928, amounting to £200,000, is entirely due to an increase in sickness benefit. The influenza epidemic in the early months of 1929 accounts for some of this, but a considerable proportion of the increase remains unexplained. The questions of medical certification and claims supervision have been considered, and various suggestions are made for stricter supervision and control. During the year 44,941 persons were referred to the regional medical staff, an increase of 6621 cases over 1928. A scheme has been set up in certain areas whereby the advice of the regional staff may be sought by practitioners in the cases of certification difficulties. In the cases referred the practitioner's opinion was upheld in 37 and reversed in 18 per cent.

Additional benefits have been provided by certain societies, but the value and extent of these benefits have been curtailed by lack of funds. For hospital treatment the Department decided that the societies could make a contribution towards the cost incurred by the member, and regulations have been issued fixing the maximum contribution for 1930 at 2*d.* per member. The third valuation of the funds of approved societies operating in Scotland showed results generally satisfactory but not uniformly so. The financial position of certain societies had deteriorated seriously during the valuation period. The continued rise in expenditure makes the future outlook both uncertain and anxious.

On the whole the report reveals the same tendencies as are shown in the Government Actuary's report in England, but industrial depression appears to have been a larger factor in Scotland. Elimination of undue claims is regarded as vitally important in the interests of the general body of insured persons.

SCHOOL MEDICAL SERVICE.

—	No. on roll.	Average attend-ance.	Routine inspec-tion.	Special re-inspec-tion.	Per cent. of defects.
County of Brecon..	9076	8128·5	3037	1400	14·8
Colchester..	5757	88%	1778	3115	20·9
Eccles ..	—	—	2127	3725	24·59

County of Brecon.

Dr. Herbert Davies agrees with Sir George Newman that the purpose of preventive medicine "is indeed to strengthen and protect the weak, but also to make the strong stronger." To this end parent and teacher must join in coöperation with doctor and nurse. Dr. Davies reviews the hygienic conditions of schools in the county, important for their direct influence on the health of the children and the efficiency of instruction, still more as a means of training young minds to appreciate the value of sunlight, fresh air, and cleanliness. He classifies the schools as: (*a*) single roomed; (*b*) grouped rooms intercommunicating; (*c*) central hall with rooms grouped around; (*d*) corridor type. Lighting is a vital matter; the importance, he says, of securing sunlight in classrooms cannot be overestimated. In this respect a number of schools are deficient, especially in type C which results in schoolrooms being placed with wrong aspects. The problem of heating is closely associated with that of ventilation; unless the heating surface is of ample capacity a sufficiently frequent change of air, he remarks, cannot be undertaken. Arrangements are being made for the drying of children's clothes, a real need in scattered rural areas. Ventilation is often unsatisfactory. In the A type much of the air comes through the cloakrooms which serve as lobbies, passing over masses of damp clothing. In types B and C the vitiated air tends to move from room to room instead of being cleared right away. The practice of flushing rooms with fresh air during recreation is fortunately becoming more universal in the county. Dr. Davies remarks on the difficulty of keeping rooms clean is increased by their being filled with heavy furniture; great improvement has followed the replacement of heavy desks by folding chairs and tables, and he recommends the provision of store rooms so that all furniture not in use at the moment can be removed. Dirt and mud from the playgrounds soon clog the mats so as to be useless; at least a pathway in the playgrounds should be paved and foot scrapers provided at the entrance. Dr. Winifred Probert assists him in the general work and treats visual defects.

Colchester.

Dr. W. F. Corfield mentions Circular No. 1054 of the Ministry of Health, unusual in bearing also the signature of the Board of Education, which dealt with the pre-school child, indicating the gap between the activities of the infant welfare schemes and those of the school medical service. The orthopædic clinic in the borough has brought to light a number of cases of slight rickets in these children, and the health nurse is being encouraged to follow up children of from 2 to 4 years of age. With a second nurse whose appointment is in prospect, it should be possible for every child to be regularly visited at least every three months until 5 years of age, or until it attends school. But much further help would be given by the establishment of nursery schools or creches; distance from home and danger of infection are objections which do not apply to such poor and densely populated districts. The liability to infection is no greater than in the streets and if an epidemic appears the centre can be closed for a while; the advantages are that the children can be taught order and cleanliness, their lives are made brighter, and defects are far more easily detected. Special arrangements are now made for orthopædic treatment of these children; there were as many pre-school children as scholars at this clinic. Similar arrangements are made for their dental care. Coördination is so close that the health visitors, who are also school nurses, in one house may have an infant and a school child to deal with, in another a child of 4 who attends school, and in a third a child of the same age who is still attending the infant welfare centre of the health authority. When pre-school children are taken under the official wing will it be as school-children or as infants? Dr. Corfield's view is that the time is ripe for a full reconsideration of the care of children from birth (or before) to 15 years of age, and he thinks that one responsible authority would make for unity and simplicity. In dental work, a step forward is the appointment of a full-time dentist, who devotes one session a week to infant welfare work; he is to be assisted by an extra nurse. Coöperation of the parents is good, their attendances reaching 80 per cent.; Dr. Corfield thinks they appreciate what is done and would not subscribe to the loose statement sometimes made that "anyone can do school medical

inspection work." In the list of schools with cases of pediculosis there are four this year with a record of nil. Comparison may seem invidious and a percentage of 15·8 at the special M.D. has an obvious reason; but there are schools in so-called better districts which have not so good a record and it does no harm to set them thinking.

Eccles.

Dr. J. E. Spence's authority has, he says, always been alive to the necessity for continuing the care and supervision which is exercised over the welfare of infants until they are admitted into public elementary schools and pass under the supervision of the school medical service. The services have been unified by the appointment of a joint sub committee for the consideration of all matters common to infant and school welfare, and of a common staff to supervise children from birth to school-leaving age. Combination of infant welfare work and school visiting has, it appears, increased the attention paid by the parents to the nurses' advice. Inspections have revealed a considerable rise in the percentage of defects, especially of tonsils and adenoids, nasal catarrh, and anæmia, all of which are largely accounted for by the severe climatic conditions of the year. These defects and those of the ear, says Dr. Spence, have their origin in the common cold, which is spread by lack of care and precaution on the part of those suffering from acute catarrhal conditions, the anæmia being perhaps a result of recurrent catarrh. The borough is proud of possessing an open-air school where excellent results are obtained. Special attention is paid to the dietary and it is found that many of the children put on weight during the week at school, which they lose over the week-end at home. Enterprise is shown in the organisation of a class for stammerers; several children relapsed to some extent on leaving school when they discontinued their vocal exercises but others derived permanent benefit. The number of children suffering from deformities is very low; no "cripple" is attending an elementary school. In the present year arrangements will, it is hoped, be made for children with deformities to attend the county clinic in Irlam, in-patient treatment being provided at the Biddulph or Ancoats Hospitals. All notified cases of tuberculosis have been kept under observation at the county dispensary. The dental clinic has completed ten years of service; the percentage of those requiring treatment has fallen from 76·4 in 1920 to 69·7 in 1929, part of the decrease being attributed to the treatment given to pre-school children. Refusals of treatment have fallen from 42·1 per cent. in 1920 to 19·7 in 1929. Many parents when refusing treatment say they will obtain it privately, but this, Mr. Broughton remarks, is simply an artifice, for if any treatment is thus sought it is merely the extraction of acutely painful teeth. In only 5 per cent. of such cases had the private dentist been permitted to carry out complete treatment, and in 26 per cent. no treatment whatever had been obtained.

PORT SANITARY AUTHORITIES.

Hull and Goole.

Dr. W. R. Frazer, in his first report to the port sanitary authority, states that 7980 ships arrived in his area during the year 1929, and of these 532 required inspection by a medical officer. No case of plague, cholera, yellow fever, or typhus was seen. A municipal aerodrome was opened during the year by H.R.H. Prince George near the docks. The water-supply of ships is from local water-works through hydrants or water boats of which there are 13, frequently inspected; 59 vessels arriving had water tanks that needed cleaning; two samples of water were contaminated with the colon bacillus. No record, it seems, is kept in ships of the origin of the water in the tanks on board. An Italian ship, *Tirreno*, carrying grain from Rosario, crew all well, and no dead rats reported, last fumigated 13 months previously, began discharge of cargo when two rats dead with plague were found. Discharge of cargo was stopped; the ship and the lighters to which cargo had been discharged were fumigated with hydrocyanic acid before discharge was resumed. In all 268 rats were found, six of them plague infected. The empty ship was again disinfected, when only three more rats were found. No case of plague occurred among the rats on shore nor among the many men who were dealing with the cargo. During the year altogether 8203 rats were killed in the port or on ships; the number has been continuously falling for five years. Of the 706 bacteriologically examined, only the six mentioned were found plague infected. On ships arriving 53 cases of venereal disease came to notice; all were told of the clinic, but 24 did not attend. Much attention was paid to sanitary defects on board ships; 7248 were examined and 1293 had defects, of which the chief were unventilated food lockers, many of them not in mess rooms, but in sleeping quarters; lighting required improvement in 52 cases; 388 closets had no flushing facilities (one ship had no w.c. for the use of the crew); unpainted granulated cork instead of wood sheathing is recommended over iron to prevent sweating and damp. Verminous conditions of bunks in crew spaces caused complaint on 150 occasions. Attention is drawn to nuisance arising from kitchen refuse accumulating on deck in dock. Of 3894 complaints, 2392 were remedied before the ships left. Among the 7133 aliens who arrived, the standard of cleanliness of transmigrants was found to be high; 45 certificates in respect of favus, trachoma, and the like were given. Fruit 171 tons, shell-fish 3 tons, bacon half a ton, were condemned as unsound. Of the 1196 canal boats, 284 had sanitary defects, and of these 261 were remedied; women and children were found on board chiefly during the school holidays.

Bristol.

Dr. R. A. Askins reports that 171 incoming ships were examined by the medical officer, 2478 by inspectors. As regards hygiene of crew spaces, 318 ships had defects, remedied in 316 (no details are given). No cases of plague, cholera, yellow fever, small-pox, or typhus appeared, but three cases of climatic bubo caused anxiety. Deratisation of 21 ships was done by sulphur, one by cyanide fumigation; of the 5727 rats destroyed 1705 were black, 2432 brown, 1590 (including 13 mice) undifferentiated. None was found plague infected. The total was twice as great in 1925. In one sailing ship with grain from Australia 21 rats were caught, and 42 more were killed by sulphur fumigation. Rat harbourage is being restricted on ships and about the docks, the more effectively since the rat-catching staffs of port and city are now unified. The venereal clinic treated 125 venereal cases with 442 attendances; 30 cases were notified from incoming ships. Grain dermatitis was brought in by a ship from Morocco; local practitioners were notified by circular. Little bad food arrives in Bristol; one side of bacon was condemned as tuberculous. Reports on seven suspicious ships' water-supplies are detailed, but not the authority's action. Water is supplied mainly from hydrants, one water boat being used in the docks.

Liverpool.

Dr. A. A. Mussen mentions 5174 visits of inspection paid to incoming ships, of which 734 (last year 933) had defects on board; there were 2670 (3131) dirty forecastles, and 277 (363) foul w.c.s, so improvement goes on. There are no water-boats in the port, supply of water to ships being from hydrants alone. Of enteric fever, six cases were landed, and of tuberculosis, 62; fewer than usual. There were no cases of cholera, plague, or yellow fever; no plague rats were found among the 4679 examined. The severe type of small-pox gave trouble with the arrival of the Anchor Line steamer *Tuscania*, of which the main facts may be briefly recapitulated. The ship left Bombay on March 14th, and passed Suez on the 22nd. On the 17th a seaman complained, and developed a

rash on face, back, and forearms, which was diagnosed as toxic erythema at Marseilles on the 27th, where he was landed and died in hospital, the diagnosis then being changed to hæmorrhagic small-pox. The 450 passengers who landed at Marseilles were notified to the medical officers of health to whose districts they were travelling, and the ship was informed, when the crew and passengers, 900 in all, were vaccinated. On March 18th a greaser had reported sick, and on the 20th developed a rash on the face and elsewhere; this was diagnosed as chicken-pox on the 22nd with the concurrence of the quarantine medical officer at Suez; nothing is said about him at Marseilles, but at Liverpool on April 1st he was removed from the ship with small-pox. The ship reached Glasgow on April 4th, 15 days from the appearance of the first rash, when further cases of small-pox were discovered. Of the total 53 cases reported, two were these early cases, 45 were contracted on board, and there were six later infections. Twelve cases were fatal. Another ship, the *Appam*, had a case of small-pox at Calabar, which was recognised at once, landed, and properly controlled, with the result that there were no other cases. Much attention was given at Liverpool to the destruction of rats on ships as well as in the port and city. In 1929, 22,369 rats were caught or killed on ships (29,189 in 1928), 1405 about the port (2250), in the city 16,398 (16,664), in all 40,172 (48,103); the figures suggest that the anti-rat campaign is achieving something. To kill cockroaches, it seems, requires a higher concentration of hydrocyanic acid than to kill rats. Estimating the number of rats on a ship by inspection is a skilled employment, requiring training and constant practice, but it can be done pretty accurately; in a group of ships in which over 500 rats were expected, 600 were found. Seamen account for half the new cases of venereal disease in Liverpool, and half the total attendances at clinics; at the Seamen's Dispensary there are in proportion more cases of soft chancre and fewer of syphilis than in the city. Electrical treatment (not particularised) has shortened the period of gonorrhœal cases. Lectures on venereal diseases have been well attended and appreciated. Of anthrax, nine cases were notified, with three deaths; two cases were connected with South American hides, three with East Indian wool, and four from tanneries at Runcorn. Cases are to be sent direct to Fazakerley hospital for early serum treatment. Disinfection of the raw material is carried out at the Government Wool Disinfecting Station; a model of the plant in use there may be seen at the Home Office Industrial Museum in Horseferry-road, London. Many shipping companies now fumigate crew's quarters after every voyage to get rid of vermin. Less unsound meat is being received at Liverpool; 1804 (1967 in 1928) tons were "utilised under supervision," including 127 tons of mutton, largely condemned on account of epizootic lymphangitis. Inspection is being improved in the countries of origin. Meat from Waterford and Cork has also had to be seized, but a certain amount of inspection is now carried out by the Irish authorities. More care has been given this year by countries abroad to packing of fruit.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 3RD, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox 306 (last week 353), scarlet fever 1829, diphtheria 1198, enteric fever 87, pneumonia 1054, puerperal fever 45, puerperal pyrexia 112, cerebro-spinal fever 19, acute poliomyelitis 5, acute polio-encephalitis 1, encephalitis lethargica 18, continued fever 1, dysentery 3, ophthalmia neonatorum 136. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on May 6th–7th was as follows: Small-pox, 548 under treatment, 33 under observation (last week 483 and 31 respectively); scarlet fever, 2039; diphtheria, 2541; enteric fever, 33; measles, 1025; whooping-cough, 64; puerperal fever, 28 (plus 16 babies); encephalitis lethargica, 119; poliomyelitis, 1; "other diseases," 19. At St. Margaret's Hospital there were 18 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (0) from enteric fever, 112 (53) from measles, 7 (0) from scarlet fever, 28 (2) from whooping-cough, 42 (13) from diphtheria, 50 (8) from diarrhœa and enteritis under two years, and 40 (5) from influenza. The figures in parentheses are those for London itself.

The three deaths from enteric fever outside London were reported from Southport, Burnley, and Sunderland. Fatal cases of measles were widely distributed with larger numbers at Liverpool and Salford each 6, Middlesbrough 4. Three deaths from whooping-cough were reported from each of Birmingham, Liverpool, Bradford, and Middlesbrough. Rhondda reported 4 fatal cases of diphtheria, Liverpool 3. Diarrhœa was credited with 8 deaths at Liverpool, 4 at Manchester. No great town attributed more than 2 deaths to influenza.

The number of stillbirths notified during the week was 321 (corresponding to a rate of 40 per 1000 births), including 70 in London.

Special Articles.

MEDICINE AND THE LAW.

Hospitals and Rates: the Basis of Assessment.

WHAT may prove an important test case on the rating of hospitals was heard on May 6th before the County Assessment Appeal Committee of Hertfordshire. The local rating authority, the Barnet Urban District Council, appealed against the Barnet and District Assessment Committee and the Barnet Victoria Cottage Hospital on the point whether the hospital should be assessed at £80 a year (the figure recently fixed by the local assessment committee) or at the former figure of £250. A brief report in the *Times* indicates that the appellants contended that the value of the hospital was £14,000 and that, if a new hospital had to be built to take its place, the cost would be £20,000. The assessment, it was stated, had been £250 for the past five years, but, recently, all the Hertfordshire hospitals had been assessed on a basis of between 30*s.* and £2 per bed; the Barnet Hospital having 40 beds, the assessment had thus been reduced to £80. The chairman of the tribunal announced that the Appeal Committee did not accept the view that hospitals should be assessed on the basis of so much per bed; the proper basis was the rent which a hypothetical tenant would pay for the property. The figure, said the chairman, must necessarily be low in the case of a hospital; though not accepting the basis of assessment, the Appeal Committee accepted the figure of £80 as reasonable and proper. The appeal was therefore dismissed, the hospital being allowed costs but the other respondents (the Barnet and District Assessment Committee) being directed to pay their own costs. The unsuccessful appellants asked the tribunal to state a case for the High Court.

It is interesting to observe that the basis of assessment by the number of beds was rejected. This basis has furnished a convenient method for calculating hospital expenses and for classifying the size of an institution. A low assessment is of vital importance for hospitals, and, as Parliament declined to exempt them from the burden of rates, it has been essential for them to succeed in avoiding heavy assessments at the hands of the local assessment committees. What the case fails to reveal is the reasons which have prompted the local rating authority to undertake the ungenerous task of attacking the cottage

hospital and to seek to overthrow the arrangement reached throughout the county for hospital assessment.

Guaranteed Cures and Fraud.

Two men, described as manipulative masseurs, were recently found guilty at Nottingham Quarter Sessions of obtaining money by false pretences and of conspiracy to defraud. They were said to have undertaken to cure, by means of massage and by the use of an oil which they sold, cases pronounced incurable by doctors. The accused protested that they had not guaranteed cures. The Recorder, in passing sentence, said it was difficult to see any extenuating circumstance; they had been found guilty of heartless and cruel conduct. The elder of the two men was sentenced to 12 months hard labour in respect of the false pretences and 15 months in respect of the conspiracy, the sentences to run concurrently; the younger was sentenced to 9 and 12 months imprisonment in the same way. They were also ordered to pay £250 towards the cost of the prosecution.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

Proprietary Preparations in Prescriptions.

OWING to competition between manufacturing chemists the number of proprietary preparations has greatly increased. This increase is detrimental to the pharmacists, because in recent years their profit on the sale of such preparations is considerably less than that accruing from making up prescriptions. The Hungarian Pharmaceutical Law allows for a good fee for preparing mixtures according to prescriptions, but allows only 30 per cent. profit on the sale of proprietary drugs. The widespread use of these, moreover, does not do the doctors much good, since patients are apt to try to treat themselves. It is not uncommon, in the present depressed financial state of the people here, for patients suffering from grave heart trouble to omit to call in a doctor because they have been advised by friends to buy a bottle of some preparation which was prescribed for a relative suffering from heart disease. The fact that large advertisements appear in the daily papers detailing the indications for the administration of this or that patent remedy is an additional reason why these are to be found in almost every household. The National Pharmaceutical Association has now circularised every doctor, pointing out the harm that proprietary medicines can do when they get into the hands of laymen. The pharmacists, it is said, have been brought to the verge of bankruptcy, and are forced to take collective action. They have no quarrel with sound preparations which are the products of scientific research, but deprecate the use in prescriptions of drugs which are merely mixtures which could equally well be prescribed separately. They request the medical profession to abstain, in the future, from prescribing proprietary drugs when they can get the same mixture made up by the pharmacist. When it is necessary to prescribe special preparations the wrappers and the enclosed literature should be removed, so that the patient will not be led to believe that the medicine is a sure remedy of all the diseases which are enumerated, and will seek advice from the proper quarters.

A Clinic for Civil Servants.

Some weeks ago Mr. A. Wekerle, Minister of Finance announced in the Houses of Parliament his intention to establish a sanatorium in the vicinity of the University Clinics for civil servants. He wishes to solve the problem of medical attendance for these officials by enlisting the service, gratuitous, or at nominal salaries, of the doctors of the neighbouring clinics. This scheme naturally provoked indignation among doctors, and the president of a Budapest medical corporation, Dr. Rosenak, voiced their protest. The medical profession, he said, is well aware of the financial position of civil servants, and their claim to reduced medical fees has always been met. Not only do doctors attend them for minimal fees, but in cases necessitating exact investigations also the public hospitals are at their disposal. The Budapest Medical Corporation has resolved to apply to the Hungarian Medical Association to do everything in its power to prevent the erection of the proposed clinic.

Protective Immunisations against Diphtheria.

A well-elaborated report on prophylaxis against diphtheria was recently contributed by B. Johan and J. Tomcsik to the Medical Society. They said that the rate of morbidity in Hungary was fairly high. Although the statistical data available were not quite reliable, still some conclusions might be drawn from them. One of the tasks of public health authorities was to cope with carriers. A very extensive search for carriers had been made in Szolnok county, but their isolation did not appear to have had much influence on the rate of morbidity in 1928. That schools are of very great importance in the spread of epidemics is best shown by the fact that during epidemics a diminution in incidence tends to follow the closing of schools. Among the substances recommended for use in active immunisation against diphtheria, the T.A.F. preparation of the German Behringwerke, and the protective ointment of Loewenstein, of Vienna, have been tried in Hungary, but the Ramon anatoxin has been more widely used than either. Most of the anatoxin immunisations have been made with the inoculation material prepared in the National Public Health Institution, where, with a slightly altered technique, some highly efficient immunising serum has been produced. Up to the end of 1929 more than 20,000 children had been inoculated, and in January of this year a further 25,000 children were immunised. No severe reactions, lasting over one week, were encountered. In children ranging in age from one to five no inoculation reaction was observed, and fever was rare. In older children moderate fever, lasting for two or three days, occurred, and in adolescents high fever, but no disquieting symptoms made their appearance. After the second inoculation more local and general reaction occurred than after the first one, while the third inoculation was followed by less reaction. The immunising value of the inoculating material was controlled in a few cases by the Schick reaction. The results of protective immunisation are estimated from the morbidity-rate. About ten months ago in Szolnok county 10,181 children were given protective immunisation. Out of these, up to now, only four have been attacked, with very mild infections. Among a corresponding group of non-immunised children during the same period 248 fell ill with diphtheria. Although the immunisations were made at the season when the incidence of diphtheria is at its height, the number of cases occurring after the first immunisation did not confirm the belief that the first inoculation may produce a rise of susceptibility of short duration (negative phase).

Artificial Abortion on Sociological Grounds.

Owing to the critical economic conditions prevailing in Hungary, the number of artificial abortions is on the increase. The Government has found it desirable to take up the matter, and the medical profession has been warned to interfere only in the most urgent cases. Lectures designed to enlighten the public on the dangers of procuring abortion are being held. Dr. Lajos Göczy, lecturer to the University of Budapest, has raised the question whether any social indications for abortion exist. From the individual point of view, he argues, an obvious indication is the danger of aggravating previously existing diseases by pregnancy or by labour at full term. Even here, however, economic considerations

cannot be ignored, since, for example, patients suffering from tuberculosis or heart disease may not be able to afford prolonged sanatorium treatment or that extra care which will spare effort during childbirth. In such cases the interruption of gestation is recommended after consideration not only of the disease but also of the social conditions of the patient. Certain authorities go still further, and are prepared to admit the principle that abortion may be induced for such reasons as the decreased earning power of the pregnant women, or the fact that the critical financial state of the family does not justify the expense of bringing up and educating more children. According to this school, so long as the State is not in a position to prevent the social evils brought about by large families among the poor, the only escape from the dilemma is artificial abortion performed on social grounds.

Dr. Göczy pointed out, however, that it is not the doctor's business to ascertain the economic position of his patients and that he might be misled by false statements or gross exaggerations, and thus connive at unnecessary abortions. Moreover, even if the investigation were to be done by some competent authority deputed by the State, the performance of artificial abortion for sociological reasons would still be outside the province of a doctor, whose task is to protect pregnancy and not to interrupt healthy gestation. If he allowed himself to be placed in a position of producing abortion on demand, the authority, not only of the individual doctor, but that of the whole medical profession, would be undermined. On these grounds Dr. Göczy would deplore the acceptance of any indications for abortion other than medical ones.

Mushroom Poisoning.

The Mushroom Section of the Royal Hungarian Plant Life and Pathological Station has issued a questionaire to all doctors practising in Hungary, asking for information, from records or from memory, of any cases of mushroom poisoning which they have come across during the last ten years. The most important data required are the names of the patients and the kind of mushroom with which they were poisoned; also the way in which the mushrooms were prepared for consumption. In Hungary there are some species of fungi which, stewed in an unenamelled iron pan, are very poisonous, while if they are cooked in the form of soup they are much less harmful, causing only slight indigestion and nausea.

A Congress on Diseases of Digestion.

The German Society for Diseases of Digestion and Metabolism will hold its tenth meeting at the Medical Clinic of the Budapest University, under the presidency of Baron Alexander Korányi, from Oct. 6th–8th. The chief subjects for discussion are as follows: Changes in Form and Posture of the Digestive Organs, with Special Reference to Ptosis and Diverticula (Prof. Vogt of Munich, Prof. Bergmann and Prof. H. H. Berg, of Berlin, and Prof. Verebélyi, of Budapest); The Organisation of the Dietetic Kitchens of the Budapest Clinics (Dr. Soós, of Budapest); Diseases of Bones in their Relation to Calcium Metabolism, Internal Secretion, and the Vitamins (Dr. Fürth, of Vienna, Dr. Pick, of Berlin, Dr. Alwens, of Frankfurt, and Dr. Wieland, of Basle; The Ætiological Problems of Inflammatory Diseases of the Digestive Organs (Dr. Kuttner, Dr. Löwenberg, and Dr. Kaufmann of Berlin, and Dr. Löhr of Kiel). In connexion with the meeting there, an exhibition of pharmaceutical preparations will be held.

A MILLION FROM A CONTRIBUTORY SCHEME.—At the annual meeting of Sheffield Royal Infirmary recently it was stated that by the end of the present year the Sheffield hospitals would have received a million sterling from the penny-in-the-pound scheme since its creation. The average cost per bed has been reduced from £134 to £125. Last year there were 5000 in-patients, 38,242 out-patients, an increase of about 5500, and 22,295 casualties.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Social Hygiene in New York.

THE New York State Department of Health founded its division of Social Hygiene in 1918. During that year lectures were delivered to audiences aggregating 2200. Since then the yearly attendance has varied between 50,000 and 125,000 persons. By the middle of January of the present year the total attendance for 12 years had passed the million mark, rather more than half of the audiences being men. As many educators and civic leaders have been included in these audiences it is believed that the essential instruction must have penetrated to all people in the State. An important research is to be published shortly as Reprint No. 1365 of the Public Health Reports. It comprises the results of a joint undertaking by the American Social Hygiene Association, the New York Tuberculosis and Health Association, the Welfare Council of New York City, and the U.S. Public Health Service. The report is the result indirectly of international conferences on health and welfare of seamen and is entitled "Seamen with Venereal Disease in the Port of New York." Of the 961 men studied 840, or 87 per cent., were single and of the remainder only 67 were living with their wives, while 30 were divorced and 23 widowers. In religion, 440 were Protestants, 386 Roman Catholics, 46 had no religion, and only 18 were Jews. The proportionate representation of the religions among seamen generally is not stated. The effects of penalties and of charging for treatment are shown to be a reduction in the number of cases applying for medical care. The provisions for treatment and the results of treatment are described at length with numerous interesting tables. The men admitted freely that the first thought on entering port is "drinks and then girls." It is significant that in 676 cases out of the 961 the first infection is attributed to a commercial prostitute. Ignorance of these diseases is astonishingly widespread; 264 men had knowledge, 388 only "vague" knowledge, while 198 admitted to knowledge of preventive methods. The need for instruction on the subject of venereal diseases is said to have been "conclusively demonstrated." The remainder of the report deals with the social facilities for seamen in the port.

Sanitary Survey in Nicaragua.

A news release from the War Department states that as a result of negotiations between the medical corps of the U.S. Army and the director-general of health in Nicaragua a sanitary survey is to be undertaken of the "Nicaragua Canal Zone." The primary purposes of the survey are "to determine the sources of diseases prevalent in the area with special attention to human carriers, prevalence of insects, and the breeding places of those known to transmit diseases; the extent to which the present inhabitants of the zone of the canal are infected by these diseases; and the water-supply for domestic purposes available in the zone, and the incidence of disease conveyed by its present use." What the secondary purposes of the survey may be is not definitely stated. One might hazard a guess that the building of the Nicaragua canal is one of them.

New Coccus Isolated in Meningitis Epidemic.

The Hygienic Laboratory reports (Public Health Reports, April 18th, 1930, p. 845) the discovery of a new form of meningococcus present in the spinal fluid of 14 cases occuring during the course of an epidemic of cerebro-spinal meningitis in Chicago in 1928. During the same epidemic 33 other specimens showed typical meningococci distributed among the four Gordon types. Morphologically the new micro-organism is indistinguishable from other members of the genus *Neisseria*. Culturally it differs in

producing a yellow pigment, and in its lack of fermentative action. It is also distinct in its antigenic relationships. The 14 strains derived from the 14 cases form a homogeneous group culturally, biochemically, and serologically. The name *Neisseria flavescens* is proposed for the new form. The Laboratory points out that this form is not represented in any of the polyvalent serums now manufactured and that it is of clinical importance, since the fatality-rate in the cases from which it was derived was not less than 30 per cent.

Antinarcotic Organisation.

Speaking recently at a banquet of the Physicians and Surgeons Society of New Jersey, Dr. Stuart Thomson gave some account of the work of the International Narcotic Education Association, an American propaganda organisation on the committee of which he serves. He said that America plans to attend the convention in London "with firm feet and clenched fist." But before making demands there the American is going to clean up his own house by putting out of business the two factories in this country which manufacture synthetic opiates. Another speaker asserted that, while most of the smuggled narcotics enter through the port of New York, an increasing quantity is crossing the border from Mexico.

IRELAND.

(FROM OUR OWN CORRESPONDENT).

"Handy-Women."

AT the annual meeting of the Irish Nurses' Union, held last week, a resolution was passed calling upon all supervising authorities to take action against the so-called "handy-women," as unregistered midwives are popularly called, in view of "the very grave consequences which have lately occurred in maternity cases where unqualified women were acting in the capacity of midwife." It is somewhat surprising to find that twelve years after the passing of the Midwives (Ireland) Act such a protest is necessary. That the evil is a real one was borne out by Mr. T. Hennessy, who suggested that in some cases a medical man had a kind of agreement with an untrained nurse because the trained nurse in the district was unfriendly to him. He advised nurses to report any such cases that came to their knowledge. It is possible that some medical practitioners are not aware that any practitioner who in any way gives countenance or assistance to an unqualified woman to enable her to practise as a midwife is running the risk of having his name removed from the Register. The General Medical Council has issued a warning notice to this effect, and there is little doubt that the Irish Medical Registration Council would take a like view of such an offence.

Motor Accidents and Voluntary Hospitals.

The daily papers in Dublin have recently given a good deal of attention to the burden that is thrown on the voluntary hospitals by the great increase in the number of accidents due to motor transport. The fatal accidents in Dublin, most of them due to motor vehicles, were 27 in number in 1927, 42 in 1928, and 66 in 1929. In almost every case the injured are brought to the nearest voluntary hospital, and rarely does the hospital receive any payment in return for the treatment given. Mr. A. B. Clery, assistant surgeon to the Richmond Hospital, calculates that, in 1929, in-patients suffering as the result of motor accidents cost the hospital between £400 and £500, while the total payments received on their behalf amounted to £82. He estimates that motor accidents cost the Dublin hospitals a sum of about £5000 annually, without taking any account of the cases treated in the extern departments. Sir James Craig hopes for some relief from the Traffic Bill which will be before the Dail in the autumn. If third party insurances are rendered compulsory by this measure, it would be easy to introduce a provision that the hospitals should have a first claim on insurance payments.

Although no cases of psittacosis have yet been reported in Ireland the Minister for Local Government and Public Health in the Irish Free State, in view of the frequent occurrences of the disease in England and other countries in close touch with Ireland, has thought it right to issue an order prohibiting the introduction of parrots.

The Sweepstakes Bill, as it is familiarly called, the measure introduced to the Dail by Sir James Craig for the purpose of legalising the holding of sweepstakes in aid of hospitals and certain other charitable institutions, passed its third reading in the Dail last week without opposition, and has gone on to the Senate.

Mr. R. V. Slattery has been appointed one of the surgeons to the House of Industry Hospitals in place of Sir F. Conway Dwyer, resigned. Mr. Slattery has been one of the assistant surgeons to the hospitals for several years.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lts. V. F. Walsh and J. A. Cusack to be Surg.-Lt. Comdrs.

ROYAL ARMY MEDICAL CORPS.

Maj.-Gen. H. P. W. Barrow, Dir. of Hygiene, War Office, relinquishes his appointment.

Col. P. H. Henderson, late R.A.M.C., to be Dir. of Hygiene, War Office.

ARMY DENTAL CORPS.

Capt. B. W. Tyson to be Maj.

TERRITORIAL FORCE.

Capts. E. L. Elliott and J. McCulloch resign their commissions.

Supernumerary for Service with O.T.C.: Lt. J. H. Strahan resigns his commission.

ROYAL AIR FORCE.

The undermentioned Flying Officers are promoted to the rank of Flight Lt.: R. E. Alderson, A. R. French, J. H. Cullinan, and P. J. Nyhan.

Flight Lt. W. Heron is transferred to the Reserve, Class D.ii.

INDIAN MEDICAL SERVICE.

Capt. D. R. Thapar to be Maj.

The undermentioned appointments are made:—To be Capts. (on prob.): J. McM. Wilder, E. G. Hurd-Wood, and W. T. Taylor.

To be Lts. (on prob.): A. K. M. Khan, F. H. A. L. Davidson, J. H. Gorman, R. T. Hicks, S. M. Kharegat, R. C. Dracup, A. B. Guild, and W. Fleming.

The undermentioned officers retire: Col. A. B. Fry and Lt.-Col. F. H. Salisbury.

COLONIAL MEDICAL SERVICE.

The following appointments have been made: Dr. L. Milburn, Medical Officer, Supernumerary, Leeward Islands; Dr. L. P. Younglao, Medical Officer, Dominica, Leeward Islands; Dr. J. A. P. Cameron, Medical Officer, Malayan Medical Service. Dr. D. S. Johnston has been appointed Medical Officer on the West African Medical Staff.

RADIUM FOR CHESTER INFIRMARIES.—An amount of radium worth £6200 has been handed over to representatives of the Chester Royal Infirmary and the Wrexham Infirmary at Chester. This comes from the £140,000 which has been raised towards the Cancer Campaign Fund through a joint appeal from Manchester, Liverpool, Cheshire, and North Wales. Mr. Joseph Banks, of Hallow Park, Worcester, has given £1000 toward a new theatre at the Chester Infirmary.

Correspondence.

"Audi alteram partem."

A UNIVERSITY DEGREE FOR THE GENERAL PRACTITIONER.

To the Editor of THE LANCET.

SIR,—As a general practitioner of over ten years' standing, may I say that your correspondents, Dr. Franklin and "M.D., M.R.C.P.," have rendered a great service to the general practitioner and the status of general practice? Their reasoned and valuable contributions to the subject of medical degrees for general practitioners must surely command the serious attention of all those who are interested in the future of the proposed post-graduate hospital at Hammersmith. The need is urgent to encourage general practitioners, who, as your correspondents so rightly emphasise, have to deal with the bulk of the sick community, to undertake systematised clinical research. For such research general practice provides rich material, and the advantages to practical medicine as a whole will be enormous.

The University of Durham has for years granted its M.D. degree to medical practitioners—that in itself is nothing new—but with the introduction of a new post-graduate hospital medical school in London, the very heart of the British Empire, the University of London has a unique opportunity of encouraging the general practitioner to continue his studies and to remain a student of medicine. The standard should, as your correspondents point out, remain high, but surely the requirements suggested:

(*a*) clinical research in general practice,
(*b*) a prescribed course of study at the post-graduate hospital,
(*c*) a practitioner of at least seven to ten years' standing,

are high enough. It is sincerely to be hoped that a matter of such importance as has been raised by your correspondents—long since overdue for consideration—will not be brushed aside, but will be brought directly to the notice of the responsible authorities for their serious consideration. By so doing they will be helping to raise the status of general practice, one of the most important branches, if not the most important branch, of medicine.

I am, Sir, yours faithfully,
JOHN L. BOOKEY, M.B., B.CH., B.A.O.

London, E., May 12th, 1930.

ANGINA PECTORIS AND CORONARY DISEASE.

To the Editor of THE LANCET.

SIR,—In his article on this subject, published in THE LANCET of April 26th (p. 908), Dr. Douglas Hubble referred to a thoery that I put forward in the last edition of Taylor's "Medicine" in these words:—

> On the analogy of œsophageal and gastric pain, cardiac pain would be due to a tonelessness and consequent stretching of the muscle, and amyl nitrite may possibly act by stimulating the muscle to contract down on its contents.

Although I still agree with the general truth of the statement, I should not at the present day use the word tonelessness; but as I have discussed the subject at length in my Oliver-Sharpey lectures (THE LANCET, 1928, ii., 1282 et seq.) I need only give a summary of my views at present, and attempt to answer Dr. Hubble's objections.

In the first place I should like to protest against his regarding myocardial anoxæmia as an alternative explanation to myocardial exhaustion or myocardial distension. I think it is quite possible that the myocardial anoxæmia hypothesis may be correct—there is, in fact, some further evidence in its favour in my lectures; but it provides no explanation of the mechanism of the pain. Anoxæmia can only provide a stimulus that brings the pain mechanism into action.

Now to deal with two objections (*a*) and (*b*). In my lectures I brought forward some experimental evidence that pain in one particular patient was associated with acute left-sided failure, while the right side of the heart was still active, so that within a few minutes a considerable amount of blood accumulated in the lungs. This might mean that the right side of the heart was working against increased resistance, and in its efforts to push on the blood the diastolic pressure rose so that the pain nerve-endings in the wall were stretched. A more vigorous contraction produced by some stimulation—e.g., amyl nitrite—might drive on the blood and stop the pain; but when gross cardiac failure has set in the muscle may be so dilated that there is not enough increased tension during diastole to cause any pain, in spite of feeble contractions. As Dr. Hubble points out, nothing is more striking than the fact that angina pectoris disappears in gross cardiac failure. The above is only meant as a picture of how pain may be produced, and I certainly do not want to be dogmatic on the subject considering the scanty evidence at present available.

Objection (*c*).—The evidence that amyl nitrite stimulates the cardiac contractions was obtained in a personal communication by Dr. Anrep to the writer as the result of his study of the heart-lung preparation. But there is also a clinical observation that amyl nitrite relieved the pain in an anginal attack without any lowering of the blood pressure; but with a great increase of the heart-rate. Of course, there was superficial vaso-dilatation; but I suppose this was compensated for by some deep-seated vaso-constriction, and it cannot have helped the heart. Dr. Hubble himself suggests that amyl nitrite causes dilatation of the coronary arteries which would on physiological principles lead to more vigorous contraction.

Objection (*d*).—While structurally plain and striped muscle are different, the pain nerve-endings in the muscular walls of the heart and œsophagus are presumably the same, and these and not the muscle are responsible for the sensation of pain. I am surprised that Dr. Hubble considers that there is no condition occurring in the stomach and œsophagus which is at all comparable to angina pectoris, when Dr. Walter Verdon introduced his œsophageal and gastric theory of angina pectoris because the conditions are so similar. Sir Clifford Allbutt also thought it reasonable that pseudo-angina might result from the œsophagus, quoting the work that Dr. W. W. Payne and myself were carrying on at that time. I believe myself that it may be very difficult to distinguish the two, and that people who suffer from angina commonly also get pain from reflex œsophageal disturbances. The best way of separating the pains clinically is to ask the patient to make one swallowing movement. If the pain is due to the œsophagus, it may be increased or it may be diminished some seconds after swallowing owing to the passage of the peristaltic wave. But the presence of œsophageal pain is not proof that the patient does not also suffer from angina, because the heart and the œsophagus are so closely related to one another.

I am, Sir, yours faithfully,
E. P. POULTON.

London, W., May 12th, 1930.

FEE-CUTTING IN PATHOLOGICAL SERVICES.

To the Editor of THE LANCET.

SIR,—At the annual meeting of the Governors of Charing Cross Hospital Pathological Institute, Mr. George Verity is reported as having stated that "the Pathological Institute was doing untold good in examining patients who are not of necessity eligible for treatment in hospital" but that "the work will be in jeopardy unless £1000 is quickly subscribed towards it."

May I beg the courtesy of your columns to point out that similar work with similar results is being done in the pathological departments attached to most of the voluntary hospitals throughout the country;

none of these hospitals has, however, as yet found themselves under the necessity of appealing to the general public for funds in support of this work. The fees charged by the Charing Cross Hospital Institute of Pathology for pathological examinations are below those charged by any similar institution in this country, and are set at a level at which, without subsidies from outside sources, it is impossible for them to be performed other than at a loss. It is not surprising to anyone engaged in similar work that the authorities of the Charing Cross Institute of Pathology having set their fees at this low level should find themselves in need of a subsidy.

As to the justification for an appeal to the public for funds to enable the continuance of this policy of fee-cutting in competition with the pathological services conducted by other voluntary hospitals, I leave to your readers to judge.

I am, Sir, your faithfully,

S. C. DYKE.

Secretary, the Association of Clinical Pathologists.
Wolverhampton, May 7th, 1930.

CALCIFIED PERICARDIUM.

To the Editor of THE LANCET.

SIR,—Having read Dr. Vilvandré's article in THE LANCET of March 15th (p. 564) on calcification of the pericardium I wish to record a case to which I was urgently called two years back. When I reached the house I found the patient dead, and was told that death had occurred about half an hour back, because before informing me they tried household remedies to restore him. The patient was a cook of about 65 years. His master had given him only light work, as he was an old servant and unable to do hard work. Before death he was doing light work, sitting and chatting with other servants, who noticed him to fall back suddenly and die. His only disability was that he took a long time to walk even a short distance, owing to difficulty of breathing.

As soon as I arrived, noting the heart had stopped beating, I gave an intracardiac injection of adrenalin, and to my surprise I found difficulty in making my needle enter the heart, and could distinctly feel the needle point touch a stony hardness. Persisting I thought I could with difficulty enter the heart, and I injected twice about 5 c.cm. of adrenalin solution. It was of no avail, as the duration of cessation of life was too long, and perhaps the adrenalin entered partly the calcareous myo-pericardium. I diagnosed the case at the time as calcareous adherent pericardium. There was no autopsy.—I am, Sir, yours faithfully,

Fort Bombay, April 17th. SHAPURJI A. BANKER.

INCOMPATIBLE BLOOD.

To the Editor of THE LANCET.

SIR,—In your issues of May 3rd and 10th Dr. S. C. Dyke refers to direct matching as the only safeguard against introduction of incompatible blood. I should like to point out that recipients often have diluted serum, weak in agglutinins, and should the donor have weak agglutinogens the direct test may not detect an incompatibility which may all the same result in disaster.

Personally I always first perform this test and, if satisfactory, test the red cells of both recipient and donor with 2 and 3 type sera of good titre; as a result of this test a further test is made in each individual, unless he is group 1, by putting up his serum with known type red cells of good agglutinogen content, either type 2 or 3 or both, with the object of obtaining a double positive result.

The method is not unduly long, as there is no need to watch to be certain that an apparent negative is really negative; the positives usually occur rapidly; if they do not, one knows at once that one of the reagents or the red cells or serum of the individual is weak, and that a closer examination is necessary, possibly with titration and absorption tests. Another advantage is that one can deal with confidence with those patients whose sera show apparent agglutination, not always easily demonstrable as due to rouleau formation, with red cells of their own group and even their own red cells. The positives obtained by the "double positive" method are usually with ease distinguished from these pseudo-reactions, which can then be disregarded.

I am perhaps fortunate in being group 3, but if search be made in any hospital staff a member can usually be found who is of this group, and does not mind an occasional drop of blood being taken. If taken in citrate saline, "packed" by centrifugalisation, and kept in an ice safe, not frozen, red cells will usually keep in quite good condition for a week.

I am, Sir, yours faithfully,

C. RICKWORD LANE.

Pathological Department, Hampstead General Hospital,
May 9th, 1930.

A HANDY CENTRIFUGE.

To the Editor of THE LANCET.

SIR,—Dr. Dyke's reference to the delay that occurs in obtaining the speedy separation of serum from a recipient's blood when the patient is at some distance from al aboratory centrifuge prompts me to say that this difficulty can be surmounted readily by using the radiator fan of a motor-car. If a Wright's capsule of blood is attached firmly, by means of adhesive plaster, or better, is placed in an easily contrived appliance, at the end of the shaft of the fan, so that the capsule lies along its length with the straight sealed end pointing outwards, a few minutes revolution by the car engine gives an adequate supply of serum. If the capsule of blood is kept in contact with the warm radiator for a short time before attaching it to the fan, a better yield of serum is obtained.—I am, Sir, yours faithfully,

Harley-street, W., May 12th, 1930. ARTHUR DAVIES.

PRACTICE IN SOUTHERN RHODESIA.

To the Editor of THE LANCET.

SIR,—May I draw the attention of men who are well qualified in medical and surgical practice to the excellent opportunities offered by the posts in Southern Rhodesia now advertised in the medical journals. The position carries a salary of £500, rising to £650 per annum as Government medical officer, with the right of private practice, a feature which, of course, makes all the difference to these posts. Southern Rhodesia has a delightful and healthy climate and the country is a most attractive one in which to settle. There are very good schools. Medical men who have been in practice there for a number of years speak very highly of the prospects afforded by Southern Rhodesia, both from a professional and social point of view.

I am, Sir, yours faithfully,

R. A. ASKINS, M.D.,
P.M.O. Elect.

Office of the High Commissioner for Southern Rhodesia,
Aldwych House, London, May 10th, 1930.

THE WATER OF TREFRIW.

To the Editor of THE LANCET

SIR,—In your issue of May 3rd (p. 984) the interesting account of the mineral wells at Belle Vue Spa, Trefriw is a little misleading in one important point. Comparison is made with the famous Matchless wells at Alabama. It should be noted that the iron in Belle Vue Spa water is entirely in the bland non-oxidised ferrous form, appropriate for internal use. As far as can be judged from published analyses it is the strongest water of this variety so far discovered in Europe or America. The water of the Alabama wells contains a considerable proportion of irritant and astringent ferric salts.

I am, Sir, yours faithfully,

Cavendish-square, W., May 8th. N. MUTCH, F.R.C.P.

CÆSAREAN SECTION UNDER SPINAL ANALGESIA.

To the Editor of THE LANCET.

SIR,—We are interested to read in your last issue (p. 1012) that Mr. J. W. Burns of Liverpool agrees that spinal analgesia is a valuable aid to the safety of Cæsarean section. In 1923, we drew attention[1] to the advantages of this method, and emphasised the following points: the powerful contraction of the uterus causing ischæmia, and conducing to a strong suture line; the immediate activity of the child; the satisfactory general condition of the patient after operation; and the special value of the method, in Cæsarean section, for cases of diabetes mellitus, phthisis, toxæmia of pregnancy, heart disease, and fibroids requiring myomectomy. We agree with Mr. Burns that morphia should be withheld before operation in order that the child may not suffer from the depressing effects of the drug. These facts have been confirmed by other observers in Great Britain and elsewhere.

The retching to which Mr. Burns draws attention, is, in most cases, produced by the pressure of the firm uterus on the abdominal contents. Usually it ceases as soon as the child has been extracted.

With but few exceptions patients are tolerant and helpful with the necessary technique, and several have willingly consented to "spinal" at a subsequent Cæsarean section.

We are, Sir, yours faithfully,

BECKWITH WHITEHOUSE.
HENRY FEATHERSTONE.

Birmingham, May 13th, 1930.

THE FIRST INTERNATIONAL CONGRESS ON MENTAL HYGIENE.

(FROM A SPECIAL CORRESPONDENT.)

THE First International Congress on Mental Hygiene was held in Washington, D.C., from May 5th to 10th. Its object was to bring together for the first time all those interested in the various aspects of mental hygiene—medical, legal, and social.

The mental hygiene movement was started in America 22 years ago by Mr. Clifford Beers and has since spread to every country in the world. The aims of the congress were to give the fullest possible ventilation to the many medical and social problems with a mental hygiene basis, and to bring together representatives from all over the world in the hope that a fuller coördination and coöperation in the field of mental health would be thereby attained.

The first session for discussion was held on May 6th, when Dr. HAVEN EMERSON, Professor of Public Health Administration, College of Physicians and Surgeons, New York City, dealt with the magnitude of

MENTAL HYGIENE AS A PUBLIC HEALTH PROBLEM.

He said that resources for interpreting mental limitations, for helping human beings in adaptation to circumstances, for guiding them, and treating them with discrimination through episodes of emotional maladjustments have greatly expanded.

No longer could the health officer satisfy his community or the sciences and arts of preventive medicine through the traditional development of programmes to control communicable diseases, to detect the physical defects of school-children, to protect maternity and infancy, and to teach the health rules of nutrition, rest, and physical recreation. He must give account to his population for the incidence of suicides, showing correlations, perhaps, with unemployment, the prevalence of divorce, nativity, sex, and occupation. Was it not at least as important that the suicide-rate had risen from 4·9 to 19·7 for each 100,000 of our people in seventy years as that the diabetes death-rate had done about the same? Was there a greater need to report upon a rising death-rate from appendicitis or to analyse, publish, teach, and if possible prevent the conditions that have brought about a rise in the divorce-rate from 26 per 100,000 to 68 per 100,000 in less than 50 years? If the Traveller's Aid stations at city railroad terminals revealed the incidence of runaway children, unwholesome homes, the too-heavy hand of discipline, the misunderstood errant child, were they not as essential to our plan of public health as the collecting depôts for diphtheria smears and typhoid cultures at drug stores and hospitals? Among unselected children of four years of age, considered by their parents to be normal, coming from self-supporting families of various economic levels in a medium-sized industrial city of New England, and showing by the standard tests a range of intelligence of from 75 to 150, 36 per cent. were found to have characteristic behaviour problems that were likely to develop into personal or family embarrassments. These unadapted or badly trained or ill-adjusted little folk were found to be distributed with considerable uniformity among the dull, the average, and the bright. The bulk of the problems presenting at this age were included under the rather general categories of fears, extreme shyness, severe speech difficulties, and the more precise phenomena of tantrums, interference with appetite for and use of foods, and enuresis. These evidences of deviation from good health appeared with an incidence higher than that of any other defect or disorder of apparently normal childhood of this age, unless it be in the realm of dentition. So far as the problems of pre-school childhood brought the boy or girl to the brink of social failure, they called for professional diagnosis, aid, and prevention.

The problem for public health, for the avoidance of behaviour problems in children under school age, was to include in the plan of service to parents such personnel as could be trusted to notice evidences of deviation from normal conduct in the home, to advise parents to seek professional guidance, when necessary, for themselves as well as for the child, and to deal with early and mild disturbances in this field, as was done with physiological errors in the field of growth, nutrition, and infection. The community was beginning to realise that the typhoid carrier and the small-pox patient were no more dangerous in the community than was the partly well mentally disordered patient. To be immune to the buffets of social intercourse was as important for a child as to carry a certificate of a negative Schick test. Failure of emotional adjustment might at any time become a communal hazard. Dr. Emerson said that the health officer must begin to ask himself such questions as: Will the psychiatrist get to the mean, lazy, ne'er-do-well before the policeman does? Will the bully the fearful child, the miserable man, meet a wise social worker before he is forced into an institution?

Evidence obtained from various studies indicated that with a population of 120,000,000, 4,560,000 under five years of age could probably show some behaviour problems which, if not noted and in some measure dealt with, would lead to personal or family dilemma or disturbance; 250,000 between five and fifteen years of age would be suffering from major speech defects, and a similar number would need special class training because of mental defect; 3,135,000 would develop some behaviour problem that calls for professional assistance. 250,800 school-children before they were fourteen years of age would be held at least temporarily as delinquents; 76,000 young men and women from twenty to twenty-four would suffer damage or distress as a result of emotional difficulties. Without counting adult delinquents or inmates of mental hospitals, one could assume that at least 288,600 could need a psychiatrist's advice within the year, and of the 1,443,000 who would become major dependency problems 216,450 would be in families in which there is a case of mental disorder.

For these 10¼ million of the people at various ages who would not be listed among the insane or the criminal, but whose lives would be narrowed, warped, tangled, and lacking in happiness or gentleness, something in the way of prevention could at least be attempted. System, method, and the persistence of organised effort by trained and understanding representatives of the sciences and of society, could and surely would show results, first among the little children and later among the army of school youth.

Discussion.

This paper was followed by a discussion, opened by Dr. GUSTAV KOLB (Germany) who said that in Germany it had not been possible to develop many new institutions since the war owing to financial considerations.

[1] Proc. Roy. Soc. Med. (Sect. Obst.), 1923, xv., 55; Jour. Obst. and Gyn. Brit. Emp., 1923, xxx., No. 4; Brit. Med. Jour., 1923, ii., 878.

but that a great deal had been done towards improving those already in existence. Social work directed to the after-care of patients who had been in institutions for the mentally diseased was being greatly extended and the principle of prophylaxis of mental illness had come to be fully accepted. There was great need for more uniformity in respect of nomenclature and classification, and he hoped that this congress would do something towards the achievement of this ideal.

Sir HUBERT BOND, who was attending the congress as the official representative of H.M. Government, hoped that this congress might be of signal service in relation to the administration of the new Mental Treatment Bill which he hoped would soon become law in England. This Bill would realise the vision expressed many years ago by Sir Clifford Allbutt who believed that the more static mind of the lawyer must necessarily come to terms with the dynamic mind of the biologist. Medicine in relation to mental hygiene had been much hampered in the past by lack of elasticity both in regard to legal and lay opinion. Elasticity was essential not only for them but for the doctor, nurse, and the social worker, who are all coöperating in the work of mental health.

Dr. GENIL-PERRIN, General Secretary of the French League of Mental Hygiene, read a paper on

SYPHILIS IN RELATION TO MENTAL HYGIENE.

He summarised the current data concerning the rôle played by syphilis in determining various mental disorders, and pointed out that the mental disorders arising indirectly from syphilis were worthy of as much attention as those which are due to its direct action. He wished to emphasise the moral trauma produced by syphilis.

Through the fear syphilis inspired it was a cause of moral disturbance, even among those who were not contaminated by it. Syphilophobia was a kind of hypochondriacal preoccupation, or phobia which was not distinguishable from the other phobias from the point of view of its psychological mechanism, but which was particularly dreadful in its consequences, since it influenced the sexual and even the social behaviour of the patient. To the conscientious individual, the discovery of syphilis in himself constituted a tragedy. The new syphilitic was in need of moral support, and this was one of the most dramatic points of contact between mental hygiene and syphilis.

Just as it was necessary to ferret out syphilis in the psychic abnormal on account of his disposition to catch and to transmit it, it was necessary, also, to look for psychic abnormality in the syphilitic because it increased inordinately his social danger.

Individuals who married against medical prohibitions must be considered psychically abnormal, and needed moral re-education.

Moral education, sexual education, prophylactic education all implied the coöperation of the mental hygienist, since he was better qualified than anyone else to decide on the best methods to employ.

In the course of the discussion Dr. WILLIAM F. SNOW (United States) spoke of the numerical magnitude of the problem. He estimated that by far the commonest age of incidence of syphilis was from 20 to 25 years and that it occurred chiefly among the relatively indigent. Dr. Snow was opposed to any compulsory control of prostitutes, who should receive treatment on the same terms as any other member of the community. It was wholly inadvisable to mark them out as a group. Any person who refused to be treated for syphilis must be suffering from some kind of mental abnormality. Mental hygienists must work in coöperation with educators and social workers in developing the right attitude of mind on the part of the public towards this great problem.

A representative from Hungary was interested to find that the statistics relating to syphilis in such a comparatively eastern country as Hungary aproximated so closely to those obtaining in France and the United States.

THE CONGRESS DINNER.

The International dinner inaugurating the congress was held on May 5th at Hotel Willard. Nearly 1000 people were present, including foreign delegates from 53 different countries. The principal speakers were Dr. William A. White, President of the congress, who took the chair; Dr. Frankwood E. Williams, the chairman of the committee on the programme; Mr. Clifford W. Beers the secretary-general of the congress, an official representative of each of the six continents, and the Hon. Ray Lynman Wilbur, M.D., Secretary of the Interior, who spoke on some aspects of the world movement for mental health. Dr. Wilbur stressed the shift from the physical to the mental aspects of life and said that it was a sign of the advance of civilisation. The power of the mind in national and international affairs was everywhere coming to be recognised as of more importance than big battalions. Even in the war it became obvious that organised propaganda was more potent than bullets. He believed that the hope for the world's future welfare and progress lay in the development of right thinking and controlled emotion, and that these questions were essentially those which came under the aegis of mental hygiene.

(To be continued.)

HOSPITAL COÖRDINATION UNDER THE LOCAL GOVERNMENT ACT.

THE LONDON VOLUNTARY HOSPITALS COMMITTEE.

Section 13 of the Local Government Act, 1929, provides that:

The council of every county and county borough shall when making provision for hospital accommodation in discharge of the functions transferred to them under this Part of this Act, consult such committee or other body as they consider to represent both the governing bodies and the medical and surgical staffs of the voluntary hospitals providing services in or for the benefit of the county or county borough as to the accommodation to be provided and as to the purposes for which it is to be used.

"The London Voluntary Hospitals Committee" is the title that has been taken by the committee elected by the hospitals in the County of London for the purpose of consultations with the London County Council under this section. There has not hitherto existed in London any suitable body for this purpose, and a scheme of representation was therefore drawn up and submitted to the hospitals, for their comments and approval, by a joint committee consisting of representatives of the Voluntary Hospitals (Local Government Bill) Committee of the King's Fund, the Conference of Teaching Hospitals, and the London Regional Committee of the British Hospitals Association. The scheme provides that every hospital in the area shall have the right to nominate at least two representatives, one representing the governing body and one the medical and surgical staff, upon an electoral body which is divided into six sections for the purpose of representing five areas (north-western, northern, north-eastern, south-eastern, and south-western) and the special hospitals whose work cannot be localised in relation to any particular area. Each of these five area committees and the non-localised special hospitals committee in turn elects its own representatives upon the central committee, the method of representation being such as to ensure that teaching, non-teaching, and special hospitals are each given proportionate representation. Meetings of the various electoral bodies were convened in the latter part of March by members of the joint committee, to which reference has been made above, and the central committee was able to hold its first two meetings during April.

Personnel of the Committee.

Lord Riddell is chairman of the committee, Dr. Geoffrey Evans its hon. secretary, and the other members are as follows :—

Mr. A. Lawrence Abel, F.R.C.S., Mr. F. S. A. Baker, Lady Barrett, M.D., Mr. O. N. Chadwyck-Healey, Mr. Thomas Clapham, Lt-Col. Clement Cobbold, Dr. Edmund H. Colbeck, Capt. the Rt. Hon. C. C. Craig, D.L., Mr. Robert Davies-Colley, F.R.C.S., Prof. L. S. Dudgeon, F.R.C.P., Mr. Arthur G. Ferard, Mr. Charles Gibbs, F.R.C.S., Sir Henry Gooch, J.P., Mr. E. L. Pearce-Gould, F.R.C.S., Dr. A. M. H. Gray, Capt. A. M. Hughes, Sir Henry Jackson, Dr. J. M. H. MacLeod, Sir George Makins, F.R.C.S., Mr. M. S. Mayou, F.R.C.S., Mr. E. Vernor Miles, Mr. Arthur Morley, Mr. E. W. Morris, Mr. Gilbert G. Panter, Mr. D. Denham Pinnock, F.R.C.S., Dr. Arthur Porter, Dr. Harold Pritchard, Mr. D. W. Roy, F.R.C.S., Dr. T. H. G. Shore, Dr. E. Bellingham Smith, Mr. H. S. Souttar, F.R.C.S., Mr. Widdrington Stafford, Mr. Thomas G. Stevens, F.R.C.S., Mr. Austin Taylor, Sir William H. Wells, F.S.A., Mr. J. P. Wetenhall, Mr. Francis P. Whitbread, Dr. C. M. Wilson.

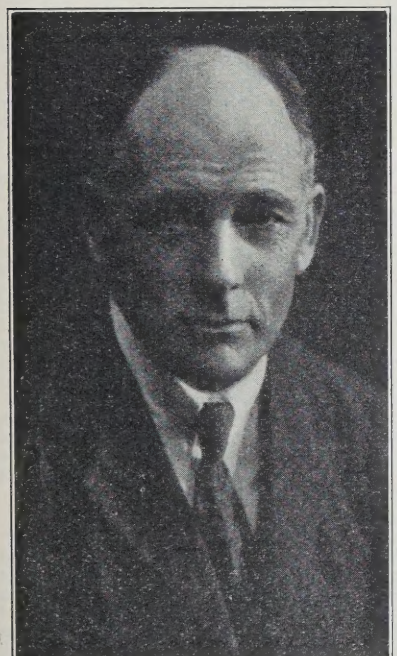
The address of the committee is 23, Park Square East, London, N.W.1.

Obituary.

JOHN EDWARD SANDILANDS, *M.C.*, M.D., D.P.H. CAMB.,

LATE EXECUTIVE HEALTH OFFICER, BOMBAY CITY.

John Edward Sandilands was born in 1872. He was educated at Harrow (E. E. Bowen's House), where he reached the VIth Form and represented the school in the Public School boxing championships before he left in 1890. After six months in Paris he went up to Trinity College, Cambridge, where his exploits will be long remembered. He read natural science and medicine, having made up his mind early in life to become a doctor, and obtained second-class honours in the Natural Science tripos. At Cambridge he made many friendships which lasted through his life. He began his clinical work at St. Bartholomew's Hospital in 1893, and qualified in 1897, taking his medical degree at Cambridge in 1918 and the M.D. and D.P.H. six years later. He held the post of house physician to Sir Lauder Brunton at Bart.'s and that of house surgeon at the Metropolitan Hospital. In 1900 he went out to India to help combat a plague epidemic; from there he was transferred to Aden, and then proceeded to South Africa to serve as a civil surgeon during the concluding months of the Boer War. On his return to England Dr. Sandilands became assistant medical officer under the Metropolitan Asylums Board on the small-pox ships at Dartford (the old Castalien or Calais Douvres) where he found the hygienic conditions far from satisfactory. Determined to gain experience in public health work he obtained an appointment under Dr. (now Sir George) Newman in Finsbury, and in 1905 he was appointed medical officer of health for Winchester, where he stayed till 1909, when he was appointed medical officer of health of Kensington. These were the days when baby clinics and various measures for child welfare were being brought into being, and he took a keen interest in their development. In the spring of 1914 he joined the Territorials, mainly in order to get the opportunity for some horse riding on economical terms. Within a few months he was called up for war service and probably welcomed the change of occupation. He went to France with the 5th Field Ambulance of the 47th Division until 1916, when he was forced to undergo a severe operation. As soon as he was moderately fit he returned for a short time to his duties in Kensington. When his health was restored he again offered himself to the Territorial Force and was refused; but he obtained a commission as a temporary officer in the regular R.A.M.C. and returned to his old ambulance in France just in time to act as a bearer officer in the great attack on Messines in 1917. For his work during this period he received the Military Cross. He continued to serve in the same field ambulance until after the retreat in March, 1918, and it was characteristic that the more risky job of bearer officer attracted him more than any other. Later he was placed in command of a motor ambulance convoy with which he remained until demobilised. Now in full health, Dr. Sandilands returned once more to Kensington, but after barely a year's work was appointed executive medical officer to the Municipality of Bombay where he stayed for nearly ten years. His work at Bombay tried his natural ingenuity and tact to the full. He was faced with the task of reconciling Western ideas of sanitation with Eastern religious beliefs—and he had some measure of success in the task.



DR. SANDILANDS.
[*Photograph by Clifton, Bombay.*

Dr. Sandilands was very popular in Bombay. There, as elsewhere, he was known as "Sandy" to a large circle of friends, and was frequently to be seen at the Yacht Club, and at the Willingdon Club where he played golf. He was very tactful, and got on well with Indians. As regards his work, he had an uphill furrow to plough. His views on public health were eminently sound, but he was unable to carry out many measures which he would have liked to see in force. Examples of these are the big drainage scheme which was much overdue, and more rigid enforcement of anti-malarial measures. He was a firm supporter of Lady Lloyd's efforts for child welfare in India. Ill-health compelled him to return home last summer, a few weeks before his appointment expired. He underwent another severe operation in the autumn, from which he had reached convalescence when he died quite suddenly on May 8th.

Dr. Sandilands had numberless friends outside his profession as well as within it. He was full of wit and humour, often seeing events from the most unexpected points of view, and he was possessed of the most arresting and fascinating powers of narration. It is the more unfortunate that his published work is scanty. In 1904 he married the eldest daughter of the late W. L. Courtney, editor of the *Fortnightly Review*, and he leaves a widow, two sons, and three daughters.

THE LATE DR. C. J. BATTLE, OF KLERKSDORP, S.A.

Dr. Charles John Battle, who died at the General Hospital in Johannesburg on March 19th in his fifty-first year, was the oldest son of Charles Key Battle, of Lincoln, and qualified from St. Thomas's Hospital, London, in 1903. Soon afterwards he went out to

South Africa, where he practised first in Natal and then on the East Rand. During the late war he served in East Africa as Captain in the South African Medical Corps under Lieut.-Colonel H. J. Orford, whom he joined in practice at Klerksdorp when the war was over. Dr. Battle was medical superintendent of the hospital there, and held office as district surgeon, railway medical officer, and medical officer of health. He had the reputation of a careful and accurate diagnostician, and five years ago came to England for post-graduate study, acting as assistant house surgeon at the Bristol Royal Infirmary. His last illness was an insidious lung infection which later became pneumonic in character and resulted in an abscess requiring incision. Dr. Battle married in 1921 Peggy, daughter of E. S. Lawlor, and leaves a widow with a boy of eight.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

DEBATE ON MINISTRY OF HEALTH VOTE.

(*Continued from p. 1044.*)

THE HEALTH SERVICES: MALINGERING.

Dr. MORGAN said that every day he was engaged in administering the Act. They had been told by a Member who was the representative of one of the industrial approved societies that the malingerer was made and not born. That was to say, he was made apparently either in his own house or in the doctor's surgery. Sir Kingsley Wood had said that lax certification was due to the fact that new doctors came along and wanted to make their practices very quickly out of the National Health Insurance Act. As one who administered the Act every day he said that from the medical point of view there was no general laxity of certification on the part of the medical profession. There was no general malingering going on. Every day he had patients coming to him to whom he had given a certificate of incapacity, and they asked him to certify them as fit. He might say, "No, in my opinion you are not fit to be taken out yet, and I will give you a certificate of incapacity still." They always agreed, and left it to the doctor to decide whether they should come off. People were gradually getting to have a knowledge of their rights, and were demanding them more and more. Some approved societies for years had been trying to educate the insured persons as to his rights against the doctor, and trying to get him to make charges against the doctor. The doctor's job was difficult enough at any time, but certain societies and their agents had tried to excite a feeling against the medical profession for what they thought was laxity. They forgot that, at the same time, the insured person was being educated in his rights against approved societies, and he knew now what he was entitled to, and that when he was ill he could receive the benefits for which he had paid. What was more, his employer was much more keen now that his employee should come under the Act and get its benefits. The Government actuary made it perfectly clear that it was a wider number of persons claiming benefit for a shorter time, and not persons claiming benefit for a long period that was responsible for the increase. A larger number of the population were taking advantage of the Act. They were ill, and the plea that the increase was due to malingering or laxity on the part of the doctor was not true. He had found, as a doctor, that it was to the benefit of himself and the insured person that the patient should come on the panel early. Many said "Shall I come on the panel or not." He used his judgment and if he said "You should," he kept them there as long as he thought they should be there. The Insurance Act was not brought into existence for the sake of the approved societies, the doctors, the chemists or the State, but for the benefit of the insured person, and the individual insured person had enough to suffer! There was equality of payment, but not of benefit. A man might be registered in Manchester, become unemployed, go to London, choose another doctor, and get ill. Then there was a whole series of performances to go through—sending certificates to Manchester, and so on, before he could get the benefit. The whole system was riddled with anomalies to the disadvantage of the person for whose benefit the Act was introduced, and part of the criticism of the doctors was employed to hide criticism of the approved societies. Because approved societies wanted to hide the charges against them for the administration of the Act they levelled charges against other people. Increased cost was not due to the change of doctor, which the patient had a perfect right to do. It was due to more than that.

The Protection of the Insured.

The doctors were organised, the State was organised, the chemists and the approved societies were organised. The one person not organised was the insured person. The sooner somebody in the country called for a league of insured persons and made them pay, say, a penny a month to see that they got their benefits and rights under the Act, the better it would be. They required to be protected not only from the doctors, but from the chemists, the societies and the State. The sooner that was done the quicker there would be a change in the administration of the Act, and the full benefits recommended by the majority of the Commissioners would be brought in. The sooner, too, would be brought about the changes recommended by the minority—hospitals and convalescent treatment, dental treatment, eye treatment, not only for those who happened to be in favoured rich societies or favoured rich occupations, but all insured persons. Seeing that they paid equal contributions, they should also have equal benefits. The Minister of Health had given a very impartial view of the situation, and when certain allegations and charges were being made, it was their duty to investigate departmentally or otherwise those allegations. What he had said was perfectly correct, that there was a gradual lowering of physique due to unemployment. They did not find that in the year the unemployment started. It took some time, owing, perhaps, to a lack of nutriment and the proper vitamin content in the lowered dietary. But after a series of years of unemployment people gradually deteriorated in physique, and when they were ill they had a tendency to ask for the benefits of health insurance. He had what he called the "in-and-outers" on his list. There were the women with varicose veins. At any time these people, if they so wished, as any doctor knew, could ask for certificates of incapacity, and he defied any doctor, specialist, medical referee, or regional referee to refuse them a certificate of incapacity. They ought never to be at work. The same thing happened with bronchitis and asthma, and he had cases of men hanging on to work when really they should not be about. These "in-and-outers" under a decent system of society would not be at work at all, but would be treated as sick and invalid. There were Members of the House of Commons who were not administering the Act, and had only a secondary knowledge of it. They had not got to go into dark, dismal buildings, barking their shins and hurting their hands on doors, and seeing the conditions under which people were living every day. Doctors had to treat pneumonia in damp dwellings, and maternity cases in disgraceful conditions. The members of the public of whom he spoke sat in comfortable offices and said "lax certification." Frequently they telephoned to know if the certification was correct or not, as if a doctor would sign a certificate without knowing what he was doing. He did not say doctors did not make mistakes; they made grave mistakes. But he was sure, from discussion with medical men all over the country, that there was no malingering on the part of the insured person and no lax certification on the part of doctors. Many changes were necessary in the Insurance Act, and he was sure that the approved societies would have to be changed. They would have to have national amalgamation and a pooling of surpluses. The insured person would insist on an equality of benefits for an equality of contributions, and when that time came approved societies with a large number of members in sheltered occupations would be up against it. He hoped that the House would allow the Minister of Health to go on and do his business without hindrance, that the committees would be allowed to do theirs, and that the medical profession would carry on the provisions of this onerous Act with the least possible difficulty.

Views of Regional Medical Officers.

Lieut.-Colonel FREMANTLE said they were much relieved to hear that the question of excessive claims for insurance benefit was under further examination. It had been suggested that the experience of the first three months of this year indicated that this phase of things was coming to an end, but he (Colonel Fremantle) doubted very much whether such a steady rise going on year after year would be terminated as quickly as had been freely suggested. And he would lay emphasis on the views of some of the regional medical officers, and more especially one opinion from one of the chief medical schools of London who took a detached line, wished to make the scheme run smoothly, and was used to dissecting and analysing such records. This review of the factors in the situation showed that there were to blame both those who took advantage of the scheme

as receivers of benefit and those who took advantage of it in administration of benefit. Both among medical men and insured persons there were a certain number who had less conscience than others. An hon. Member put the number of malingerers as high as 1 per cent.—that was to say, out of 17,000,000 persons there would be 170,000 potential malingerers. He would not have put the figure so high, but they must all recognise that malingerers existed. Ordinary human beings tried to get the most out of a State service; in fact it came natural to them. As his friend the regional medical officer said in his review, that state of affairs was not confined to any one class. No one was more responsible for this attitude towards national insurance than Mr. Lloyd George who managed to send the cry "ninepence for fourpence" throughout the country—a most immoral doctrine which had its vogue. Now the disadvantages of it were recoiling on the insurance scheme. If there were a deliberate attempt to defraud the scheme he did not think there would be any difficulty in detecting and preventing such definite frauds. But it was generally not fraud either on the part of the insured person or the doctor. He asked hon. Members who had been trying to make the doctors the scapegoat to recognise that the facts of the case were the other way round. Here was one of the most vivid descriptions he had seen as to how this affected the individual:—

"The patient, feeling desirous of a rest, goes to his panel doctor and practically says, 'I do not want a prescription but only a certificate.' The doctor, knowing the immediate result which a refusal would bring about, rarely dares to disoblige. It is no trivial annoyance for an angry patient to remove his name from the doctor's list, because it does not stop at that; he tells his friends and acquaintances and the doctor gets a bad name in the neighbourhood, which is detrimental to his income."

That was the way in which this regional medical officer summed up the situation. Naturally it was his business to please his patients, whether they were private or panel patients. He remembered one doctor summing up a busy practice in this way: "My practice is to give the patient the benefit of the doubt, and if after some time there are still doubts, then I give my partner the benefit of the doubt, and in the last resort I refer the case to the regional medical officer, and give him the benefit of the doubt." That was the way medical men carried on a very busy practice, and if they had a rule-of-thumb method of carrying out their duties that was very serious. Although there might be a setback in the first three months of the year, he (Colonel Fremantle) believed that the real fault was inherent in the system, and was due to the fact that it was a State system supported by the notion of the Labour party that the nation had a bottomless purse, and the Government always had the idle rich to draw upon. Let them contrast that with the old system of the friendly societies, as summed up in the societies' reports over and over again, for this induced a spirit of loyalty among the members. There was then a tendency among the members to make the best of things and come on the funds as little as possible. Owing to the effort to spread the principle so as to go into every nook and cranny and relieve every form of hardship in every form of sickness, they had done away with the voluntary principle which once attached to the separate and independent entity of the friendly societies, and they now had endless claims on what was regarded as a bottomless national purse. They could not reverse the hands of the clock; they had to try to encourage the old spirit which formerly attached to friendly societies. They had to cultivate the spirit of loyalty in friendly societies on the one hand and among medical men on the other in order to get through the difficulty. It was no use trying to coerce any body of professional men, most of all medical men, because they had always got the whip hand in the end. They alone understood the technicalities and it was necessary to work with them. The Ministry of Health had been extraordinarily sympathetic towards medical men in understanding their difficulties and helping them through. There was now a scheme under which a medical practitioner whose action was called in question could submit his case first of all to the judgment of the regional medical officer, and then to a jury of medical men. This would have the greatest effect upon medical practitioners. It was suggested that medical men were too lenient in these cases, but the last thing medical men wanted to do was to cover up the misdeeds of those who were letting them down. The chief difference between private practice and insurance practice was that there were penalties in the latter if doctors did not thoroughly examine their patients and gave certificates for sickness benefit without discrimination. Those were the doctors they wanted to catch. The Minister of Health was trying to devise a method by which they could be caught and penalised, because they had no use for them. Those were the opinions of those who spoke with the experience of the British Medical Association, and they represented the opinion of the great majority of the doctors.

Excessive Prescribing.

Two particular cases of excessive prescribing had been brought to the notice of the Ministry of Health, and they had been referred to the referees. In one case the referees upheld the decision of the Minister, but not in the other. It was shown, however, that excessive prescribing did exist. Some of those who wished to support the idea of giving benefit at any price had taken the line that medical men were justified in prescribing to any extent so long as they were doing what they considered was best for their patient. In this particular case it was a firm of four men who, as reported by the referees, were all men of very high principle, who wished to do the best for their patients; but the amount of prescribing in that case could not possibly be countenanced. This question was obviously a very delicate one. The ordinary doctor, certainly in his day, was brought up to be fairly regardless of cost in regard to prescriptions, dressings, equipment, and so on, in the hospital, but it was a very different matter when one had to provide these things for himself in private practice. The natural tendency was for a man to use these things without regard to cost, and that tendency must be restrained, but without damaging the effect of the advice. The only way to do that was to take the profession generally into confidence, and get their coöperation. He believed that good machinery had been devised now which would meet this case. It was necessary to watch the tendency, which was liable to be a fatal one, on the part of people to fall back into the arms of the State in order to get everything done for them. The idea was futile in the matters of the prevention of ill-health that the State could do things for the individual. Prevention was only possible so far as the community would do its part. A very remarkable statement was made last November at the National Conference of Friendly Societies. The chairman said:

"There is in evidence, however, another development less desirable in its reaction upon the life of the nation. Useful though these schemes of national health insurance are, there is a very real danger in their over-development. Any scheme, however good, which removes the incentive to provide for the future, and encourages all and sundry to look to the State to make provision for that future, forgetting all too often that they themselves are the State, must tend to weaken the national fibre, which thrives and develops in an atmosphere where thrift is practised and where self-reliance and independence are fostered."

He (Colonel Fremantle) could not believe that excessive prescribing was in any way associated with the increase of sickness, owing to the industrial difficulties through which the country had passed. They had seen the death-rate figures steadily coming down year after year from 1921, and an even more definite indication of health conditions was the fact that infantile mortality had steadily gone down. It was quite true that there was a small rise in this very accurate index of the health of the nation during 1924 and 1925, but the decline after that continued, the figures being 75, 70, 70, and 65, respectively. Yet another index of sickness was the tuberculosis death-rate. The number of deaths from pulmonary tuberculosis had gone down from 33,000 to 29,000 per annum, and the number of deaths from other forms of tuberculosis had gone down from 10,000 to 7000. He did not believe that there was any real increase of sickness among the people. Some of the very best and most useful health work done throughout the country was done by voluntary societies and voluntary hospitals, and he hoped that every effort would be made to encourage these schemes in the future administration of local government and of the health services of the country, not least in connexion with the post-graduate hospital which had been so warmly commended on every side, though, he thought, a little without regard to the difficulties that there must be in enlisting the voluntary skill and experience and efficiency which were at present associated with the medical schools in London and elsewhere in the country. He hoped this new post-graduate hospital, founded with such excellent intentions after so many difficulties and failures, would manage in some way—though it was difficult to realise how—to enlist the best sympathies and efforts of all the 13 medical schools in London, and that they might expect the creation of the greatest post-graduate medical school in the world, and certainly in the Empire.

Treatment at British Spas.

Mr. PERRY appealed to the Minister of Health to sanction the inclusion in additional insurance benefits of treatment at British spas for rheumatism and allied diseases. At present the cost of such treatment was beyond the means of the vast majority of the workers. The British Spas Federation had drawn up a scheme for the consideration of the Ministry and the approved societies. They had come to an agreement with the British Medical Association in regard to the scale of fees under which exactly the same medical service and treatment now given to private patients would be

available for insured persons. It was approximately 18s. a week for the baths and course of treatment. The medical fees worked out at 7s. a week, or a guinea for a course of three weeks' treatment. At the moment no hostels or institutions were provided, but he believed that arrangements had been made whereby at a cost of 35s. a week good, high-class accommodation could be provided for those attending and taking treatment. That meant that at an approximate inclusive cost of £3 or 3 guineas a week, if approved societies were encouraged to make this one of their additional benefits, treatment at English spas, similar in every way to that enjoyed by those who had the means to undergo it, would be at the disposal of insured persons.

Reply to the Debate.

Miss LAWRENCE (Parliamentary Secretary to the Ministry of Health), replying to the debate, said that taking the total increase of £216,573 for administration in England and Wales, this was accounted for as follows: £50,000 in automatic increments, £18,000 due to the cost of living increase, £118,000 due to the administration of new services, £11,000 in respect of the increase of the whole-time dental staff, and £11,000 due to various increases in regard to initial expenditure on medical staff. It was under Sir Kingsley Wood's administration that the men's sickness claims rose from 76 to 107 per cent. of expectation and disablement claims went up from 54 per cent. to 100 per cent. It was also under the right hon. gentleman's administration that the regulation allowing panel patients to change their doctors at very short notice was begun. But she did not intend to follow the right hon. gentleman in the manner and temper of his speech. This was really a very big and somewhat obscure question, and it was not new. The truth was that these claims had risen steadily from 1921 to 1928; 1928 was the peak year. The number of claims had not been analysed for the two later years, but she would give some figures as to the total amount paid in benefits. In this total she was adding in for the last two years for comparison the £2,000,000 transferred to the Widows', Orphans' and Old Age Pensions Fund. In 1927 the amount rose to £18,135,000. In 1928 it went down by nearly £1,000,000—adding in the £2,000,000—and then rose again in 1929 to £19,600,000; but in the opinion of the experts the increase was wholly due to the lamentable influenza epidemic of the earlier months of the year. The figures were dropping now in the earlier months of this year. It was very remarkable that the duration of sickness had hardly risen at all, but there had been an increase in the number of claims in respect of short illnesses. If that were due to improper certification, the practice might increase, but it was not so, because the statistics were almost unaltered during those years. That led one to believe that there were other reasons besides those which had been stated. She asked the Committee not to pass any rough-and-ready judgment on this mass of very confused statistics. The report which had been issued was one of the most valuable things that either the medical profession or the approved societies had ever had. The Ministry proposed to follow up the report and to give the information year by year The approved societies and the medical profession had now rather changed their mind and were inclined to think that a somewhat longer period within which a patient might change his doctor was necessary. The British Medical Association and the Council of Approved Societies had drawn up a scheme under which they would be able to review the case of any one of their professional brethren.

Dr. MORGAN: Will the hon. lady consider the possibility of a doctor who is unpopular, not for medical reasons, being dealt with unjustly by his colleagues who differed from him not medically but for other reasons?

Miss LAWRENCE said that she thought that the general medical opinion of the district was very much better and more acceptable for correcting any eccentricity in a medical man, because the representatives of all the persons concerned were considered.

Sir KINGSLEY WOOD asked if Miss Lawrence would give a little more information to the Committee about the new regulation in relation to the penalisation of doctors and the method of dealing with the matter?

Miss LAWRENCE said that the British Medical Association, the Conference of Panel Committees, and the Consultative Council of Approved Societies had agreed that where there was anything abnormal in a doctor's certification a panel committee should be chosen from the panel doctors in his own area to review the case.

Mr. MCSHANE: Is it not true to say that every one of those doctors who are going to sit in judgment is an interested person?

Miss LAWRENCE said that was so in a sense. The panel practitioners in a district have a common interest in maintaining the professional prestige of their brethren, an they also have a pecuniary interest in not cutting down to much the fees of any member of their body. They would report to the Minister who would have in reserve the usual powers where a case was proved of deducting something from the remuneration of the practitioner concerned.

Dr. MORGAN: Will the practitioner have the right of appeal?

Captain GUNSTON: Would the hon. lady say what action is going to be taken if it is found that a doctor has behaved wrongly? Is he going to be debarred from practice?

Miss LAWRENCE said the usual method was to make a certain deduction from the remuneration of the doctor concerned.

Mr. T. LEWIS: Will the approved societies or insurance committees have any part in this review?

Miss LAWRENCE: No. It has been agreed that it shall be the panel doctors in the locality who will investigate such matters.

The debate was adjourned.

MINISTRY OF AGRICULTURE VOTE.

ON Monday, May 12th, the House of Commons went into Committee on a vote of £2,312,310 for salaries and expenses of the Ministry of Agriculture.

Mr. BUXTON (Minister of Agriculture) stated that the sum devoted to research and education had now risen to £750,000. A survey ship for fishery research was to be built at a cost of £80,000. This work was also of great importance in connexion with river pollution. It was undoubtedly a public scandal that so many of our delightful rivers were being turned into open sewers. In regard to the Royal Veterinary College, the Treasury had sanctioned a grant of £100,000 from the Development Fund on a £1 for £1 basis. The Colleges ought to be rebuilt at the earliest possible moment, and the Ministry would be prepared to help in every possible way.

Tuberculosis in Cattle.

Dr. HASTINGS drew the attention of the Minister of Agriculture to the question of tuberculosis in cattle. He said that the question was an important one for farmers, because the cattle most affected were milch cattle, and they did not contract the disease in their early years, but when they had reached the milk producing age. He asked the Minister if he could give any accurate estimate of the number of cows so affected. It had been suggested that they numbered nearly 1,000,000, or 40 per cent., of the milch herds of this country. Something between 4 and 8 per cent. of the samples of milk exhibited for sale were found to contain tubercle germs. About 2000 deaths occurred each year among human beings as a result of infection by the bovine bacillus. As far as they knew the germs reached the human subject in nearly every case by means of milk. Apart from deaths, 20,000 persons were affected by the disease. It affected young children more than adults, and was the cause of 46 per cent. of the cases of glandular tuberculosis, 50 per cent. of the cases of lupus, and 66 per cent. of the cases of tuberculous meningitis. He would like to know what was being done to mitigate and cure this terrible evil. It had been suggested that by pasteurising milk everything necessary was done, but by pasteurising an impure article they did not make it pure; the toxins and bacteria were not destroyed. There was also clear evidence that certain changes took place in milk as the result of pasteurisation. There was clear evidence that the calciums contained in milk were changed by heating and became less digestible and less easily absorbed. Experiments showed that children did not do so well on pasteurised milk. So in the interests of mankind, as well as those of the citizens and farmers of this country, it was desirable that the Ministry of Agriculture should do everything in their power to eradicate tuberculosis from the cattle of this country. So far as he knew their chief activity in the matter centred round the Tuberculosis Order, 1925. From a report issued for 1928 he noticed that something like 1700 cattle have been slaughtered; 162 cattle, or 1 per cent., were so bad that they died before there was time to slaughter them. It was also interesting to note that out of 347 cattle reported as giving tuberculous milk, 264 had no lesions of the udder at all. Did the Minister believe that the eradication of tuberculosis in cattle was going to be effected by merely destroying animals which were so badly infected that 1 per cent. of them died before there was time to slaughter them? In his opinion nothing short of the complete eradication of the disease in cattle would do what was necessary. It seemed to him that what was being done under the Tuberculosis Order was merely to destroy cattle after a good deal of mischief had already been done. Were the cowsheds in which these animals lived disinfected, and were experiments being carried out by the Ministry in regard to the immunisation of calves against tuberculosis or the rearing of stock which was not susceptible to that disease? Another point was that farmers in this country had to pay for the T.T. certificates, and also the fees of veterinary

surgeons who tested their cows. In Denmark, he understood, the services of veterinary surgeons, and the tuberculin used for testing, were given free, and it would be very useful if the same thing could be done in this country. There was another method which he suggested might be adopted by the Ministry—namely, the method of "accredited" herds. Under that method which was in use in America, farmers were assisted to have their herds tested, and as soon as "accredited" herds were produced in any number in a district, an attempt was made to establish what was known as an "accredited" area. Where 75 per cent. of the farmers wished to form an "accredited" area, compulsion was used on the rest, so that the herds might be made free from tuberculosis.

Reply to the Debate.

Dr. ADDISON (Parliamentary Secretary to the Ministry of Agriculture), replying to the debate, said that the position of this country with regard to agricultural research was a discredit to an intelligent community. For the last few years we had been spending millions in compensation for animals which had been burned in connexion with outbreaks of disease. It was only the other day that we began to spend any substantial amount on research in the cause of prevention of foot-and-mouth disease, after we had spent at least £10,000,000 in compensation for animals which were destroyed because they were thought to be infectious. That remark applied to our attitude with regard to many other animal diseases. Some years ago, in regard to medical research and scientific industrial research, the then Government, of which he was a Member, got together a committee to exercise a general oversight, and to give comprehensive advice as to the lines which that research might take, the type of cases where research might be undertaken, and so on. They were now engaged in considering a provisional report with the idea of seeing whether they could adapt that kind of suggestion to agricultural research. It seemed to him, without being committed at this stage to the recommendations, which they had only seen for a few days, that the committee offered the most helpful possible suggestions. It was quite evident that if they were going to have organised, well-directed research, designed to remove the chief causes of waste and loss in agriculture, they must have some machinery of that kind. That was why the committee had been investigating the matter during the last few weeks.

The vote was agreed to.

HOUSE OF LORDS.

WEDNESDAY, MAY 7TH.

Workmen's Compensation (Silicosis) Bill.

THE Committee stage was concluded, and the Bill was reported without amendment to the House.

HOUSE OF COMMONS.

WEDNESDAY, MAY 7TH.

Health Insurance in Scotland.

Mr. STEPHEN asked the Secretary of State for Scotland if he would consider the introduction of legislation to protect the rights of unemployed men and women, on the lines of the prolongation of Insurance Acts, in view of the fact that otherwise thousands of men and women would cease to be eligible for health insurance benefit at the end of this year.—Mr. JOHNSTON (Under Secretary for Scotland) replied: I am aware of the position mentioned by my hon. friend, and the matter is being considered by my right hon. friend, the Secretary of State, in consultation with the Minister of Health.

THURSDAY, MAY 8TH.

Notification of Psittacosis.

Mr. MANDER asked the Minister of Health whether it was the intention of the Government to make psittacosis a notifiable disease, in accordance with the recommendations of the health section of the League of Nations.—Mr. GREENWOOD replied: In view of the obscure nature of psittacosis I am advised that it is unlikely that any useful purpose would be served by compulsory notification of the disease. Medical practitioners and others have already been invited to report suspected cases of psittacosis to the local medical officer of health, or to my department, and I have no reason to suppose that this procedure is not being followed. The recommendation in favour of notification to which the hon. Member refers is, so far as I am aware, only an expression of opinion by the compiler of a recent review of psittacosis published in the monthly Epidemiological Report of the Health Section of the Secretariat of the League of Nations.

Progress of Housing.

Mr. SIMON asked the Minister of Health if he would state what was the total number of houses completed since the termination of the war up to the latest convenient date; and what proportion of these houses were for letting.—Mr. GREENWOOD replied: The total number of houses completed in England and Wales since the termination of the war up to March 31st last, including houses of a rateable value not exceeding £78 (or £105 in the metropolitan police district) erected by private enterprise without State assistance, is approximately 1,463,000. I regret that I am unable to say what proportion of these houses are for letting; the number of houses erected by local authorities was 527,769, and the great majority of these were built for letting.

Child Mortality in India.

Mr. FREEMAN asked the Secretary of State for India how many children, per 1000, born in India died during their first year; and to what extent this was estimated to be due to the effects of opium.—Mr. WEDGWOOD BENN replied: The rate per 1000 of deaths of children under 1 year old in 1927 (the latest year for which figures are available) are: males, 174·1; females, 159·30. I am not aware of any attempt having been made to estimate to what extent, if any, this death-rate is due to the effects of opium.

Preservatives in Cream.

Brigadier-General CLIFTON BROWN asked the Minister of Health whether he would withdraw the order forbidding the use of preservatives in cream which had caused a reduction of that article with a consequent loss to agriculture and an increase of unemployment in the businesses concerned.—Mr. GREENWOOD replied: Representations on this subject were recently made to my right hon. friend, the Secretary of State for Scotland. I am considering the question in consultation with him, and a decision will be announced as soon as possible.

Maternity Accommodation.

Dr. HASTINGS asked the Minister of Health the number of maternity beds recognised by his department for grant in voluntary and municipal institutions respectively.—Mr. GREENWOOD replied: On April 1st, the date on which grants for these purposes were placed on the new basis under the Local Government Act, there were 1538 maternity beds in voluntary institutions, and 1023 such beds in municipal institutions, in respect of which grants were paid by my department.

National Medical Services.

Mr. FREEMAN asked the Minister of Health whether his attention had been called to the proposals of the British Medical Association to nationalise the medical services of this country; and what steps, if any, he proposed to take to give them practical effect.—Mr. GREENWOOD replied: I assume that my hon. friend refers to the proposals described by the Association as proposals for a general medical service for the nation. These proposals have only recently been published, and I have not yet had an opportunity of considering them closely; but I do not gather that they are intended to have any such effect as is indicated in the question.

Health of Teachers.

Dr. VERNON DAVIES asked the President of the Board of Education (1) if he had any statistics as to the health of men and women teachers; and if there was any evidence to show that the health of women teachers was not as good as that of men teachers; and (2) if he could express in percentages of the number of teachers employed in either sex the 347 men and 1609 women teachers who were granted infirmity allowance for the three years ending March 31st, 1930; and if these allowances were for life or for a limited period of time.—Sir CHARLES TREVELYAN replied: The infirmity allowances awarded in the three years ended March 31st, 1930, represent in the case of men 0·2 per cent. of the total number of teachers employed, and in the case of women 0·4 per cent. These allowances are awarded for life. These figures show that a higher percentage of women qualify for infirmity allowances; but I have no other evidence which would justify me in drawing a comparison between the sexes in the matter of health.

MONDAY, MAY 12TH.

Dangerous Drugs in India.

Mrs. HAMILTON asked the Secretary of State for India whether the Government of India had recently authorised the cultivation of the coca plant and the manufacture of cocaine.—Mr. WEDGWOOD BENN replied: No, Sir. The facts of the case are that recently the Government of India, in order to strengthen the means at their disposal for carrying out their obligations under the Geneva Convention, placed before the Indian Legislature a Bill to control the traffic of

dangerous drugs. One clause of the Bill prohibited the cultivation or gathering of the coca plant, and to this clause the select committee added the proviso that the prohibition did not apply to the cultivation or gathering of the plant by Government, the object being to allow Government to grow the coca plant and to experiment in the manufacture of cocaine if at any time it were thought desirable that the cocaine required for proper medicinal uses in India should be produced in India. This appears to be the foundation of the incorrect report that the Government of India have authorised the cultivation of the coca plant, and the manufacture of cocaine. No action in this direction has been taken nor, so far as I am aware, is any contemplated. The Dangerous Drugs Act, which has passed into law, merely makes this legally possible.

Medical Examination of Pensioners.

Dr. HUNTER asked the Minister of Pensions whether he would arrange forthwith that no further medical boards should be held on pensions (except on deterioration claims, errors of final awards, Article 9 claims, or setting aside cases), and that the present assessment, whether on a deterioration or current award basis, should be made as current for the next three years.—Mr. F. O. ROBERTS replied: The number of cases in which further medical examination is requisite is now reduced to very small proportions. I have full sympathy with the hon. Member's desire that medical re-examination should be reduced to the minimum possible, and it is the practice of the Department to give prolonged awards wherever justifiable. But I have no power to authorise awards which are not covered by medical certification, or to refrain from awarding a permanent settlement in those cases which are suitable for it.

Dr. HUNTER asked the Minister of Pensions whether he was prepared to take the necessary steps to make statutory all awards, whether errors of final awards, or on over seven years' claims, so as to give the same rights to these pensioners as to others.—Mr. ROBERTS replied: Legislation of the kind referred to is not contemplated as either necessary or desirable. The mere grant of statutory powers to make awards of the two classes referred to would not, of itself, confer material rights which pensioners do not already possess.

TUESDAY, MAY 13TH.

Merchandise Marks Orders.

In reply to Sir Nicholas Grattan-Doyle, Mr. WILLIAM GRAHAM (President of the Board of Trade) stated that the classes and descriptions of imported goods in respect of which Orders in Council had been made under the Merchandise Marks Act, 1926, requiring them to bear an indication of origin, included surgical, medical, dental, and veterinary instruments and appliances; aseptic hospital and dental furniture, and dental supplies; cotton-wool, gauze tissues, sanitary towels, spring balances, and scientific glassware.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—A meeting of the Council was held on May 8th, with Lord Moynihan, the President, in the chair.

Prof. L. G. Parsons and Mr. Seymour Barling attended, and on behalf of the medical staff of the Birmingham General Hospital presented a replica of Partridge's portrait of Joseph Hodgson, president of the College in 1864.

Diplomas of Membership were conferred on 136 of the candidates whose names we gave on May 3rd as recipients of the L.R.C.P. (excepting A. H. Baker, C. C. Bryson, W. W. Gerrard, C. C. Kapila, J. I. Rerrie, and Samuel Scher) and also upon Julia A. Boyd, Royal Free, and Laura M. Hollingsworth, University College.

Lord Moynihan was reappointed representative of the College on the Court of Governors of the University of Sheffield for three years from July 1st.

The President also reported that a vacancy on the Court of Examiners occasioned by the retirement of Mr. Graham Simpson would be filled at the next meeting of the Council.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—A quarterly meeting of the College was held on May 6th, with Sir Norman Walker, the President, in the chair.

Dr. James Kirkwood Slater, Dr. John Henry Douglas Webster, and Dr. Sydney Watson Smith were introduced and took their seats as Fellows.

Lieut.-Colonel William Frederick Harvey and Dr. Herman Petrus Gunnar were elected to the Fellowship.

Dr. John Orr was elected a representative of the College on the committee of management of the triple qualification The Parkin Prize was awarded to Prof. R. J. S. McDowall.—The award of the Lister Fellowship was divided equally between Dr. Ralph Stockman Begbie and Dr. Donald Stewart.—Dr. W. A. Alexander was granted recognition as a lecturer on the practice of physic.—The College decided to celebrate the 250th anniversary of its foundation on St. Andrew's Day, 1931.—Intimation was made of a bequest by Mrs. Isabella Kirk Duncanson for the foundation of a Fellowship in medical research.

ON May 10th Dr. H. B. Brackenbury, chairman of the Council of the British Medical Association, was admitted to the freedom of the borough of Hornsey. He was mayor of Hornsey in 1905 and has been a member of its council for 26 years.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—The next series of lectures and demonstrations on tropical hygiene, which are intended for those outside the medical profession who are going to the tropics, will be given by Lieut.-Colonel G. E. F. Stammers, between May 28th and June 6th. The lectures will be from 5.30 to 7 P.M., and full particulars may be had from the Secretary of the school, in Keppel-street, W.C.1.

ROYAL SANITARY INSTITUTE.—A sessional meeting will be held at Blackburn on May 30th and 31st. Dr. J. J. Buchan will open a discussion on the Reorganisation of Poor-law Hospitals under the Local Government Act, and Dr. V. T. Thierens will speak on the Need for Further Legal Powers with Respect to Ice-cream.

LONDON HOSPITAL MEDICAL COLLEGE.—The distribution of prizes in this college will be made by Lord Rayleigh, F.R.S., on Tuesday, June 24th, at 3 P.M.

BIOCHEMICAL SOCIETY.—A meeting of this society will be held at the School of Medicine, Leeds, to-day, Saturday, May 17th, at 3 P.M.

NATIONAL PHYSICAL LABORATORY.—The President of the Royal Society, as chairman of the General Board, is holding a reception at the National Physical Laboratory, Teddington, on the afternoon of Friday, June 27th.

WEST SURREY HOSPITAL LEAGUE.—Last year the Royal Surrey County Hospital at Guildford received £6831 from this League, which is equivalent to one-third of the year's ordinary expenditure. The League, formed only two years ago, has a membership of 26,000.

UNIFORMITY OF HOSPITAL POLICY.—It has been arranged that the Birmingham General Hospital and the Queen's Hospital shall interchange representatives at the meetings of the respective boards of management. It is hoped thus to secure greater uniformity of policy.

KING'S COLLEGE HOSPITAL.—Last year there were 7006 in-patients, and the daily average of patients received was 349; in addition, 674 babies were born in the maternity ward. At the end of the year the hospital had a debt of £65,867.

HERTFORD BRITISH HOSPITAL, PARIS.—At the request of the committee of management Lord Tyrrell, the British Ambassador, who is honorary president, has appointed a commission of inquiry to report on the necessity of modernising and enlarging this hospital. The members are Lord Linlithgow (Chairman), Sir Basil Mayhew, Mr. Herbert L. Eason, Mrs. Loch, Mr. Evelyn M. Toulmin, and Mr. R. H. P. Orde, honorary assessor to the commission. The accommodation of the hospital has become insufficient to meet the growing demand for admission by members of the British community in Paris and British subjects from all parts of the Empire.

BRISTOL HOSPITALS.—On May 1st Lord Moynihan opened a new operating theatre at the Bristol General Hospital. He had come to Bristol a few years ago, he said, and had inspected a theatre in this hospital which he had described as the worst theatre in a first-class teaching school in this country. He had now come back to open one that was as good as any that he had seen anywhere. On his previous visit he had come as a friend and critic, and had judged the institution by the very high standard which modern surgery demanded. Judged by such standards it still fell short. In Bristol there were two hospitals, and he thought it a mistake that they had not amalgamated. It was not right that the General Hospital and the Royal Infirmary should be separated, and unless they amalgamated themselves they would find that someone outside would do it for them—and less satisfactorily. The university should be the centre of research, and all the work that the hospital was capable of doing. Lord Moynihan concluded by congratulating his audience on what they had done, and by fervently hoping that they would do much more.

LEBANON HOSPITAL.—Dr. Bedford Pierce will take the chair at the thirty-first annual meeting of this hospital, to be held in the vestry hall of St. Martin's-in-the-Fields, at 3.30 P.M. on Friday, May 23rd. The hospital is at Asfuriyeh, near Beirut, and is the only one of its kind in Syria.

MALARIA IN SOUTH AFRICA.—The Union Government, having definitely decided to start a scientific investigation into the malaria menace in South Africa, has appointed Prof. N. H. Swellengrebel, of Amsterdam, to conduct the necessary research. He is expected to go to South Africa in September. It is stated that Colonel S. P. James, of the English Ministry of Health, was invited to undertake the work, but was unable to do so.

LEPROSY RESEARCH IN SOUTH AFRICA.—The committee appointed to advise the Union Government regarding leprosy research and other matters relating to leprosy in the Union was gazetted on April 11th, as follows: Dr. J. A. Mitchell, Secretary for Public Health and Chief Health Officer for the Union, chairman; Sir Spencer Lister, Director of the South African Institute for Medical Research, or his deputy, Prof. A. W. Falconer; Prof. O. K. Williamson; Dr. A. Pijper; Dr. A. J. Orenstein; Dr. Karl Bremer, M.P.; Dr. F. C. Wilmot, Assistant Health Officer for the Union; and Dr. G. W. Robertson. The appointments are for the period ending December, 1935, and the Committee is to meet annually or more frequently as convened by the chairman.

NORTHAMPTON GENERAL HOSPITAL.—Mr. Thomas Singlehurst, of Northampton, has offered £10,000 for the provision of an in-patients' ophthalmic department of this hospital. Mr. Singlehurst gave an out-patients' ophthalmic department to the hospital six years ago.

STUDENTS' BEDS AT BIRMINGHAM.—As the result of their annual carnival on behalf of the hospitals of the city the students of Birmingham University last week endowed, at a cost of £1250 each, two more beds at the Queen's Hospital. Fifteen beds have now been endowed from this source. The carnival produced a total of £6700.

QUEEN'S HOSPITAL FOR CHILDREN.—Patients' contributions have risen from £3124 in 1925 to £6665. The first part of an extension scheme, which is about to be begun, will include accommodation for nursing mothers in connexion with a ward for babies, which is to be built with money from the Children's Jewel Fund. Sir James Carmichael is building an extension of the Little Folks' Home at Bexhill which will provide room for ten more children and accommodation for the nurses.

DESTROYING AN ISOLATION HOSPITAL.—Following the recent example of the Yeovil town council the corporation of Doncaster have set fire to their old isolation hospital which has just been replaced by a new institution. Most of the buildings were of wood and corrugated iron, and it was feared that if they were preserved they might spread infection. Carr House, the original hospital, was formerly the residence of the Childers family, and there, in the middle of the eighteenth century, was bred the famous racehorse, "Flying Childers."

UNIVERSITY COLLEGE HOSPITAL.—Last year 8374 in-patients and 77,129 out-patients were treated. The cost per occupied bed was £181, a reduction of £4. The patients' dietary has been revised and supplemented by adding meat breakfasts and rations of sugar and jam, and the prejudice of patients against even the best quality of margarine "has been partly overcome" by the issue of a half ration of butter. The provision of these extras will cost an additional £2000 a year. According to the annual report the new diet kitchen is "proving an invaluable aid to medical treatment, more especially in relation to specific diseases, such as pernicious anæmia, diabetes, &c."

A RHEUMATIC CLINIC IN BRIGHTON.—At a conference at Brighton on April 30th a resolution was carried unanimously favouring the establishment of a rheumatic clinic in the town. The gathering comprised representatives of the Brighton and Hove corporations; British Medical Association; Brighton and Sussex Friendly Societies' Council; Brighton Insurance and East Sussex Insurance Committees; Industrial Approved, British Red Cross (Sussex Branch), and Brighton and Sussex Mutual Provident Societies; Brighton and Hove Chamber of Commerce; and Brighton and Hove Hotels Association. The resolution recorded that the representatives of these organisations were strongly in favour of the establishment of a clinic locally, urged Brighton corporation to take the necessary steps at an early date, and appointed a subcommittee of one representative from each of the associations to arrange the details.

EXTENSION OF NELSON HOSPITAL.—Princess Mary has laid the foundation-stone of a new maternity wing and other extensions of Nelson Hospital for Wimbledon, Merton, and district. The Princess "proved" the stone with an oak mallet made of wood from the *Victory*.

EDENBRIDGE COTTAGE HOSPITAL.—On Saturday last Prince Arthur of Connaught laid the foundation-stone of the Edenbridge war memorial cottage hospital. The existing hospital was founded in 1920 in a temporary building; it is said to have been the first in England to start a contributory scheme, and it has never been in debt. A scroll was placed within the foundation-stone inscribed with the names of those to whom the hospital is a memorial.

MIDDLESEX HOSPITAL CHILDREN'S WARD.—This new ward, given by the late Mr. Bernhard Baron, came into use last week, when it was visited by Prince and Princess Arthur of Connaught. The ward, which is for surgical and medical cases, is brightly decorated, and the walls are covered with tiles upon which nursery rhymes are depicted; there is a deep blue dado and the cots are a bright blue. Upon arrival patients are placed in isolation wards separated by glass partitions where they remain for three or four days unless they have a clear medical history.

STAFFORDSHIRE MENTAL HOSPITALS. — Reports presented to the annual meeting of the Staffordshire Mental Hospitals Board showed that overcrowding exists in each of the three asylums—Stafford, Burntwood, and Cheddleton. At Stafford the excess over the authorised numbers is 98; and at Burntwood, where there are 947 patients, it is 30. The asylum visiting committee are pressing for the erection of an admission hospital at the latter institution. At Cheddleton (1133 patients) there is an excess of 34 females.

TRIBUTE TO A MEDICAL MAN. — Sir Garrod Thomas, M.D., who, for the last 25 years has been Chairman of the board of Directors of the Royal Gwent Hospital, at Newport, Mon., has been presented with a life-size bronze bust of himself, the work of Mr. L. S. Merrifield, and an album containing an illuminated address with 5000 signatures. Sir Garrod, who formerly sat in Parliament for South Monmouthshire, presented the bust to the hospital.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, Wimpole-street, W.

TUESDAY, May 20th.—5.30 P.M., GENERAL MEETING OF FELLOWS. Ballot for election to the Fellowship. 8 P.M., PATHOLOGY. Special General Meeting. To consider the suggested change in the times of the meetings of the Section—viz., 5 P.M., instead of 8 P.M.

THURSDAY.—8.30 P.M., UROLOGY. Annual General Meeting. Election of Officers and Council. Discussion on The Technique and Results of Prostatectomy. Opener: Mr. Kenneth Walker. Followed by Mr. Swift Joly, Mr. John Everidge, Mr. Clifford Morson, Sir John Thomson-Walker, and others.

FRIDAY.—8 P.M., EPIDEMIOLOGY. Annual General Meeting: Election of Officers and Council. Paper: Dr. P. Stocks: Infectiousness and Immunity in Regard to Chicken-pox, Whooping-cough, Diphtheria, Scarlet fever, and Measles.

CHELSEA CLINICAL SOCIETY.

TUESDAY, May 20th.—7.30 P.M., Dinner at the Hotel Rembrandt, Thurloe-place, S.W., followed by a discussion on Sleep, to be opened by Dr. S. A. Kinnier Wilson and Mr. P. Seymour-Price.

LONDON CLINICAL SOCIETY.

TUESDAY, May 20TH.—8.45 P.M. (at the London Temperance Hospital), Dr. A. Remington Hobbs: Puerperal Sepsis: Early Symptoms and Signs and Treatment by Drainage.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, May 19th, to SATURDAY, May 24th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W., M.R.C.P. Special Course, Lectures on Tuesdays and Fridays at 8.30 P.M. Tues., Dr. L. S. T. Burrell: Intrathoracic Tumours. Fri., Dr. L. S. T. Burrell: Bronchiectasis and Abscess of Lung.—WESTERN OPHTHALMIC HOSPITAL, Marylebone-road, N.W. Wed., 11 A.M., Mr. Rugg-Gunn: Clinical Demonstration. No fee.—PRINCE OF WALES'S HOSPITAL, Tottenham, N. Fri., 2 P.M., Dr. L. R. Yealland, Clinical Demonstration. No fee.—CENTRAL

LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C. Last week of clinical course.—CENTRAL LONDON OPHTHALMIC HOSPITAL, Judd-street, W.C. Afternoon course, continuing for four weeks.—MAUDSLEY HOSPITAL, Denmark Hill, S.E. Course in Psychological Medicine. Clinical practice of hospital in addition to lecture-demonstrations.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Afternoon course, clinical instruction and lectures.—CITY OF LONDON HOSPITAL FOR DISEASES OF HEART AND LUNGS, Victoria Park, E. Second week of course. All day can be spent at hospital.—Further particulars from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, May 19th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose, and Throat Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations. 4.30 P.M., Mr. N. B. B. Fleming: Some Fundus Conditions (Special Lecture).
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat, and Ear Clinics. Operations.
FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M., Medical, Surgical, and Children's Diseases Clinics. Operations.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, May 19th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Wards.
TUESDAY.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Mr. Hamblen Thomas: Throat, Nose, and Ear Dept. 2.30 P.M., Sir Henry Simson: Gynæcological Operations.
WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2.30 P.M., Mr. Donald Armour: Surgical Wards. Dr. Scott Pinchin: Medical Out-patients.
THURSDAY.—11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Department. 2 P.M., Mr. MacDonald: Genito-Urinary Department.
FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Department. 2 P.M., Mr. Sinclair: Operations.
SATURDAY.—9 A.M., Mr. Vlasto: Throat, Nose, and Ear Operations. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Children's Department.
Daily, 10 A.M. to 5 P.M., Medical, Surgical, and Special Out-patients, Operations, Ward Visits, Anæsthetic Courses.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

MONDAY, May 19th.—5 P.M., Dr. H. Haldin-Davis: Drug Eruptions.
TUESDAY.—5 P.M., Dr. J. E. M. Wigley: Napkin Area Eruptions in Infants.
THURSDAY.—5 P.M., Dr. J. M. H. MacLeod: Leprosy.
FRIDAY.—5 P.M., Dr. W. Griffith: Bullous Eruptions.
MONDAY, May 26th.—5 P.M., Dr. J. A. Drake: Streptococcal Infections of the Skin.
TUESDAY.—5 P.M., Dr. W. J. O'Donovan: Tuberculosis of the Skin.
THURSDAY.—5 P.M., Dr. W. N. Goldsmith: The Nervous System in Relation to Skin Diseases.

UNIVERSITY COLLEGE, Gower-street, W.C.

WEDNESDAY and THURSDAY, May 21st and 22nd.—5.30 P.M., Prof. F. J. Cole: The Early History of Generation and Comparative Anatomy. (Last two of six free lectures.)

ST. MARY'S HOSPITAL INSTITUTE OF PATHOLOGY, W.

THURSDAY, May 22nd.—5 P.M., Prof. C. A. Lovatt Evans: Stages in the Investigation of the Physiology of the Heart.

GREAT NORTHERN HOSPITALS POST-GRADUATE LECTURES.

WEDNESDAY, May 21st.—3.15 P.M. (at the Royal Chest Hospital, City-road), Dr. Saxby Willis: Bronchiectasis.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.

TUESDAY, May 20th.—5 P.M., Mr. A. L. Walker: The Causes of Maternal Mortality.

NATIONAL HOSPITAL POST-GRADUATE COURSE, Queen square, W.C.

MONDAY, May 19th.—12 noon, Dr. Greenfield: Cerebro-spinal Fluid. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Collier: Subacute Combined Degeneration.
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Mr. Armour: Spinal Injuries.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Mr. Julian Taylor: Trigeminal Neuralgia.
FRIDAY.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Mr. Elmquist: Demonstration of Re-educative Methods (in Exercise Room).

UNIVERSITY OF BIRMINGHAM.

THURSDAY, May 22nd.—4 P.M., in the Medical Lecture Theatre, Edmund-street Buildings), Sir John Bland-Sutton: The Blood Trail. (Ingleby Lecture.)

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, May 20th.—4.15 P.M., Dr. R. S. Paterson: Radiology in Compensation Work.
FRIDAY.—4.15 P.M., Mr. W. R. Douglas: Demonstration of Surgical Cases.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

WEDNESDAY, May 21st.—4.15 P.M. (at the Western Infirmary), Dr. J. G. Tomkinson: Skin Cases.

Appointments.

HALLER, B. C., L.R.C.P. & S. Edin., D.P.H., has been appointed Medical Officer of Health and School Medical Officer, Bilston.

MURRAY, E. F., M.D., Ch.B. St. And., F.R.C.S. Eng., Hon. Gynæcologist, Royal Victoria Infirmary, Newcastle.

WILSON, EDRIC FRANK, F.R.C.S. Eng., Honorary Assistant Surgeon to the South Devon and East Cornwall Hospital, Plymouth.

Royal Infirmary, Manchester: RAYNER, H. H., F.R.C.S. Eng., Hon. Surgeon; SOUTHAM, A. H., M.D., M.Ch. Oxf., F.R.C.S. Eng., Hon. Assistant Surgeon.

Certifying Surgeons under the Factory and Workshop Acts: DAGGER, R. L., M.D., B.S. Durh. (Morpeth); and SHANKEY, P. J., M.B., B.Ch. Belf. (Rhayader, Radnor.)

Vacancies.

For further information refer to the advertisement columns.

Bath, Royal United Hospital. H.P. £120.
Berkshire C.C.—Asst. Tuber. O. and General Med. Asst. £600.
Birmingham P.H. Dept., Tuberculosis Section.—Temporary Asst. M.O. 7 gns. a week.
Birmingham, Queen's Hospital.—H.P., Res. Anæsth., and Cas. H.S. Each £70.
Birmingham, Selly Oak Hospital.—Cas. O. At rate of £200.
Bolton Infirmary and Dispensary.—Res. Surg. O. £250.
Brighton, Royal Alexandra Hospital for Sick Children.—H.P. £100.
Bristol, Clifton Dispensary, Dowry-square.—Res. M.O. £300.
Bury St. Edmunds, West Suffolk General Hospital.—Jun. Res. M.O. £120.
Cambridge, Addenbrooke's Hospital.—Res. Anæsthetist. Also H.P. At rate of £180 and £130 respectively.
Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.
Chelmsford Borough.—M.O.H. &c. £800.
Chingford, Hospital for Infectious Diseases.—Res. M.O. £300.
City of London Hospital for Disease of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.
City of London Maternity Hospital, City-road, E.C.—Asst. Res. M.O. At rate of £80.
Colchester, Royal Eastern Counties Institution for Mental Defectives.—Jun. Asst. M.O. £350.
Cumberland C.C.—Asst. County M.O.H. £600.
Derbyshire Education Committee.—Asst. School M.O. £600.
Doncaster Royal Infirmary.—2nd H.S., 3rd H.S. Each £150. Also two Hon. Anæsthetists. £50.
Dreadnought Hospital, Greenwich.—Anæsthetist. 50 gns.
Durham County Hospital.—Sen. H.S. At rate of £160.
East London Hospital for Children and Dispensary for Women, Shadwell, E.—H.S. Also H.P. Each at rate of £125.
Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Med. and Surg. Regs. Each £100.
Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.
Fleetwood, Rossall School.—Res. M.O.
Gloucestershire Royal Infirmary and Eye Institution.—H.P. and H.S. At rate of £135 and £100 respectively.
Gt. Barrow, nr. Chester, East Lancs. Tuberculosis Colony, Barrowmore Hall.—Asst. M.O. £250.
Great Yarmouth General Hospital.—H.S. £125.
Guildford, Royal Surrey County Hospital.—Res. Med. and Surg. O. and Reg. £250.
Halifax Royal Infirmary.—3rd H.S. At rate of £125.
Hertford County Hospital.—H.P. At rate of £150.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Hon. Psychiatrist. Two Med. Regs. Also Clin. Path.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S. Also H.P. Each at rate of £100.
Huddersfield Royal Infirmary.—H.S. At rate of £150.
Hull Royal Infirmary.—H.S. At rate of £150.
Liverpool School of Tropical Medicine, Pembroke-place.—Research Asst. £400.
London Hospital, E.—Cardiographic Dept. Paterson Research Scholar, £400.
London Lock Hospital, 91, Dean-street, W.—Hon. Surgeon to Out-patients.
Manchester, Ancoats Hospital.—H.S. At rate of £100.
Manchester City.—M.O. for Maternity and Child Welfare Centres. £600.
Manchester Royal Children's Hospital.—Sen. M.O. to Out-patient's. £300.

Manchester Royal Eye Hospital.—Jun. H.S. £120.
Manchester Royal Infirmary.—Surg. O. to Out-patients. £35.
Manchester, Withington Hospital, &c., Nell-lane, West Didsbury.—Three Jun. Asst. M.O.'s. Each at rate of £275.
Miller General Hospital, Greenwich-road, S.E.—Pathologist. £600. Out-patient Officer. At rate of £150. H.P., and H.S. Each at rate of £125.
Mitcham Junction Isolation Hospital.—Asst. R.M.O. £200.
Nottingham General Hospital.—2nd Cas. O. At rate of £150.
Perth, County and City Royal Infirmary.—Jun. H.S. Also H.P. Each £100.
Perth Prison and Criminal Lunatic Dept.—M.O. £440.
Plymouth, City of.—Deputy M.O.H. £750.
Plymouth City Hospital.—Res. Med. Supt. £1000.
Portsmouth Royal Hospital.—H.P., 3rd H.S. Each at rate of £130. Also Cas. O. At rate of £100.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Asst. Res. M.O. At rate of £80.
Rotherham County Borough.—Asst. M.O.H. &c. £700.
Rotherham Hospital.—Sen. H.S. £200.
Royal Free Hospital, Gray's Inn-road, W.C.—H.P.'s and H.S.'s to Special Depts. Obstet. H.S. £150. Also District Obstet. Asst. £100.
Royal London Ophthalmic Hospital, City-road, E.C.—Nine Out-Patients Officers. Each £100.
Royal National Orthopædic Hospital, Gt. Portland-street, W.—Hon. Anæsthetist.
St. Bartholomew's Hospital, E.C.—Physician.
St. Mary's Hospital, W.—Surgical Registrar. £200.
Saint Pancras Dispensary, 39, Oakley-street, N.W.—Res. M.O. £185.
Salford, Lancs., Hope Hospital.—Asst. M.O. At rate of £250.
Salford Royal Hospital.—H.P. Also Cas. H.S. Each at rate of £125.
Sheffield, Jessop Hospital.—Res. M.O. £175.
Sheffield Royal Hospital.—Res. Ophth. H.S. Also Res. Anæsthetist. Each at rate of £80.
Southampton Borough Hospital.—Res. M.O. £275.
Southampton, Royal South Hants. and Southampton Hospital.—Asst. H.S. and Cas. O. Each £180.
Streatham Babies Hospital, Leigham-court road, S.W.—Res. M.O. £100.
South-Eastern Hospital for Children, Sydenham, S.E.—Asst. and Res. M.O.'s. At rate of £100 and £75 respectively.
Swansea General and Eye Hospital.—H.S., Cas. O., and H.P. Each at rate of £150.
Warwick, Warwickshire King Edward VII. Memorial Sanatorium, Hertford Hill.—Med. Supt. £800.
Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £150.
West London Hospital, Hammersmith, W.—Hon. Surg.
Weston-Super-Mare General Hospital.—Res. H.S. £130.
Weymouth and District General Hospital.—H.S. £180.
Willesden General Hospital, N.W.—H.P. £100.
Windermere, Ethel Hedley Hospital for Crippled Children.—Res. H.S. At rate of £150.
York Dispensary.—Res. M.O. £150.

Births, Marriages, and Deaths.

BIRTHS.

LEWSEN.—On May 14th, at 83, Teignmouth-road, N.W., the wife of Dr. S. Charles Lewsen, M.R.C.P., of a daughter.
O'NEILL.—On April 17th, at British Families' Hospital, Karachi, the wife of Squadron Leader C. T. O'Neill, R.A.F. Medical Service, of a son.
PIDCOCK.—On May 8th at The Friary, Winchester, the wife of B. Henzell Pidcock, M.B., B.S., F.R.C.S., of twin sons.
PLUMPTRE.—On April 29th, at Kodai Kanal, India, the wife of Major Cyril M. Plumptre, F.R.C.S.E., I.M.S., of a daughter.
SANDFORD.—On May 6th, at St Barnabas Hospital, Saltash, the wife of Dr. F. Rossall Sandford, of a son.
WORSLEY.—On May 7th, at Black Torrington, Devon, the wife of Dr. R. Carmichael Worsley, of a daughter.

MARRIAGES.

SIMPSON—BEACH.—On April 29th, at the Church of the Holy Trinity, Prince Consort-road, Kensington, Charles Walter Simpson, M.B., B.Ch., of Beaconsfield, Bucks, to Margery Joan, second daughter of Mr. H. G. Beach, of Fordingbridge.

DEATHS.

BAKER.—On May 5th, at a nursing home, Frederick Grenfell Baker, M.R.C.S., L.R.C.P., L.S.A.
BRIDGMAN.—On May 10th, at Broomfield, Dawlish, Henry Edward Bridgman, M.R.C.S., L.R.C.P., formerly of Burton-on-Trent, in his 81st year.
HELM.—On May 12th, at Bradshaw-street, Moss Side, Manchester, William Alexander Helm, M.B., Ch.B., aged 58 years.
LANG.—On April 13th, 1930, at Jansenville, Cape Province, Arthur Joseph Lang, M.R.C.S., L.R.C.P., second son of the late Dr. and Mrs. John Lang (formerly of Southport, Lancashire).
MCCOWAN.—On May 2nd, Gladys, wife of Peter K. McCowan, M.D., M.R.C.P., "Velindre," Whitchurch, nr. Cardiff.
THOMAS.—On May 8th, at Bank House, Brecon, Thomas Price Thomas, M.A., M.R.C.S., L.R.C.P.
WEIGHTMAN.—On May 2nd, at Mylor, Cornwall, Edward John Weightman, M.B.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

Notes, Comments, and Abstracts.

SHOULD MEDICINE BE A MENDICANT?

A REVIEW OF OUR HOSPITAL SERVICE.

Harveian Lecture delivered at the Harveian Society of London on March 13th

BY ERNEST W. HEY GROVES, F.R.C.S. ENG.,
PROFESSOR OF SURGERY IN THE UNIVERSITY OF BRISTOL.

(*Concluded from p. 1051.*)

Voluntary System not Adaptable to Modern Developments of Medical Science.

MEDICAL practice used to be founded on the teaching of ancient masters, and it consisted in the empirical administration of drugs to sick people. Some handling of the patient was necessary to let out his poisoned blood, or to cover his sores, and this rather menial handiwork was relegated to the barber or chirurgeon, whilst the indecencies of childbirth were relegated to the midwife. In such practice there was obviously no advantage in, or necessity for any institution, except for the feeding and lodging of the poor. The tradesman and well-to-do patient was attended at home. But for 300 years this crude application of empirical knowledge has been gradually replaced by scientific study of disease, and within the past century the rate of advance has been so much accelerated that in its last quarter everyone of us can look back on his own student days as a time when the science of medicine was comparatively simple and knowledge of disease restricted.

But however much medical science may grow as the mysteries of infinite nature are discovered, the practice of medicine still has to be carried out by human beings of very finite capacities. Therefore it is that the growth of knowledge has necessitated subdivision of labour—in other words, medical specialism. First of all there was the separation of surgeons, as a separate class from physicians, and their attainment of an independent status, then a long time later some physicians became accoucheurs and midwifery was accepted as a necessary specialism, whilst the development of optical science and optical instruments called forth the ophthalmic surgeon. The segregation of infectious fevers and of mental cases became necessary for protection of the rest of the community.

Thirty years ago specialism had not got much further than this. The general hospital had physicians, surgeons, physician-accoucheurs, and ophthalmic surgeons, whilst fevers and mental diseases were placed in isolated institutions with medical attendants of their own. But since that time scarcely a decade passes without some corner of the territory of medical knowledge being so enlarged as to demand special workers and explorers for its investigation and utilisation. Physician-accoucheurs have taken off their coats and scrubbed their hands and become surgeons and gynæcologists. Diseases of the ear, nose and throat have acquired a domain of their own; dental surgery, anæsthesia, pathology, bacteriology, public health, tuberculosis, radiology, and venereal diseases have established undisputed claims to separate recognition. Orthopædic surgery has established an overwhelming claim which for various reasons has not been fully granted. Such subjects as neurology, cardiology, and genito-urinary diseases show a tendency to departmental segregation, but still for the most part form only subsections of the parent medicine or surgery. At the moment we are considering whether radium therapy is to be a new department or merely a new agent to be used by physicians, surgeons, and gynæcologists.

Some subjects—e.g., radiology—involve so much technical knowledge and apparatus that they become special departments very quickly. Others, such as orthopædics, difficult of definition and being founded on general surgical principles, are very slow to be segregated. But I think no one will dispute that advance of knowledge and accuracy of treatment always follow the intensive study and teamwork, which is involved in making any special department. This was well illustrated during the war, both in regard to fractured femurs and facial injury. The treatment of gunshot fractures of the femur, which was a matter of terrible failure at the beginning of the war, became satisfactory just so soon as it was treated as a special subject, the patients being brought together, a team of surgeons and nurses trained to carry out the treatment, and a proper continuity of after-treatment secured. So whether we like it or not, we must face the fact that the giant growth of medical science, unaccompanied by a corresponding giant growth of supermen, can only be practised and

advanced by groups of men, taking each a special study and accumulating special experience. But, on the other hand, the patient, the sick or injured man, is only one, and his ailment must be studied as a whole, or at any rate by several men working in coöperation with one another.

Fission and Fusion.

Therefore both for the healing of the individual and for the advance of knowledge, it becomes necessary to provide for some living fusion of the parts of the medical organisation to counteract the necessary fission which every day differentiates its units more and more from one another.

A simile may be borrowed from the development of animal life. Both in growth of an individual from the ovum to the adult, and in the evolution of the race from the amœba to man, two great processes take place in measured harmony. The cells divide and become differentiated from one another, both in structure and in function, so that at last a great variety of tissues and organs are produced. But this division and differentiation is accompanied by a coördination of all parts, controlled by a central nervous system. I think it may be fairly claimed that medical science in its growth and development must conform to these two natural and immutable laws: differentiation and coördination, or fission and fusion. It would be easy to push this analogy further. The team of students, doctors, and nurses working in any special department may be likened to one organ in the body, the hospital unit to a group of organs carrying out one special vital function, whilst the medical service of the country represents the living body as a whole. The general practitioners may be likened to the free and roving cells of the blood, constantly visiting each organ of the body in turn, giving to and taking from each.

But enough of a fanciful analogy, and let us return to plain facts. The growing complexity of medical science with its vital necessities of differentiation and coördination necessitates quite a different grouping of patients and doctors from that which sufficed 100 years ago, and was fairly satisfactory even at the beginning of the present century. Then it was reasonable to treat the rich man at his own home, and to collect the indigent in poor-houses of which the voluntary hospital was one variety. Now, not only has the distinction between poor and rich become less marked, but medicine has become a science which can only be applied under scientific conditions, and the classification should no longer be between rich and poor, but between one type of disease and another. If elaborate apparatus, special laboratories, expensive operating theatres, and a team of medical men and nurses are necessary to investigate the disease and to treat the injury of a poor man, then these are equally necessary in the case of the rich or middle classes. The middle classes have enough common sense to understand this quite well, and they do now actually form the bulk of the patients in our voluntary hospitals, whilst the unfortunate rich man has still to make shift with some arrangement improvised in his own mansion, or with the scanty resources of a small nursing home.

The general hospital of the future must take in patients of all social classes if they are suffering from disease which requires investigation and expert treatment. It must be large enough to include all the special departments of medicine and surgery. It must also be large enough to give the greatest economy in overhead charges, equipment, and personnel. In large centres of population, 500 bed hospitals would probably represent the best size of unit. Where multiple small hospitals exist, these should be amalgamated into groups with a single administration and a united staff. Isolated hospitals must be retained for certain types of cases—e.g., mental diseases, fevers, tuberculosis, and venereal disease.

Probably diseases of an essentially chronic and incurable nature in poor patients will also require special hospitals. But diseases of slow course but curable nature such as surgical tuberculosis and poliomyelitis, which necessitate special country hospitals, certainly should not be made on a class basis. All the arguments adduced above can be urged here for making centres of maximum efficiency, where patients of all social classes can be received.

In country districts and small towns where the ideal big hospital is not possible, small hospitals are a necessity, but they ought to be all brought into coöperation with the big hospital service scheme. Even the most remote country districts ought to be linked up with the county town or big city, so that medical practitioners can easily get the services of consultants, and patients can readily be transferred who require special treatment. A ten bed cottage hospital may be an inestimable boon to a country district, but that is no justification for trying to make it do the same work as is possible in the primary general hospitals, nor is it any justification for expecting the medical men who staff it to be experts in every branch of medical science. There should be no such thing possible as an isolated small hospital independent of supervision and control. Every such hospital should be definitely linked with a large one, so that the freest exchange of consultation and patients can take place between one and the other. I believe that a system of this sort has already been adopted, with excellent results in the Highlands and Islands of Scotland.

Obstacles in the Way of Accomplishment.

The two first great obstacles which hinder the attainment of an ideal hospital service in this country are the voluntary or mendicant system upon which the great and teaching hospitals are dependent, and the lack of any central body with the knowledge and power to control and direct. The action of both these obstacles is well illustrated by the happenings in a large city with which I am well acquainted. Ten years ago it was urged that there existed in the district a pressing need of an open-air school hospital for chronic and curable disease, chiefly affecting children. This need is now being met by three perfectly independent bodies. The municipal authority is completing a hospital for surgical tuberculosis, a charitable organisation is opening a hospital for non-tuberculous diseases, whilst an existing children's hospital is enlarging its premises and making open-air wards in order to cope with exactly the same type of case as the other two. So that before long there will be three institutions each of 100 beds competing instead of coöperating, requiring three sets of administrative officials, three sets of apparatus, and, what is worst of all, three sets of experts. This lamentable and indefensible absurdity was foreseen, and an attempt made to prevent it, but when the promoters met together it was evident that they only really agreed about one thing, and that was the determination to maintain their independence, each one of the other, and so long as they depended upon independent sources of income no outside authority could be brought to bear upon them in order to force amalgamation, however much this might be for the common good. The Local Government Act of 1929 has gone a long way towards making possible a general unification of the hospital system. We await with interest its results. In its broad outline it brings together the municipal and voluntary hospitals. It removes the stigma of pauperism from the former institutions. It sets up a machinery whereby a local committee can bring about some coöperation between the two classes of hospitals. But it leaves untouched the fundamental error of regarding the great voluntary hospitals as institutions for the care of poor people which have to be maintained by the donations of the rich. And in its provision for coöperation it is rather permissive than authoritative. If in any locality there exists a broad-minded wish for amalgamation and coöperation, it provides the machinery by which this can be brought about. It is instructive to notice that up to the present Aberdeen seems to have gone furthest in adopting this plan of voluntary coöperation between the different types of hospitals. Aberdeen, which has gained a world-wide reputation for a canny care for money and of avoidance of waste! Just as you can tell an Aberdeen boat at a distance because no seagull thinks it worth while to follow in its wake to pick up what is thrown away, so Aberdeen leads the way in substituting coöperation for competition, so as not to waste money or skill in the provision of the best hospital service for the sick and injured.

It is often assumed that if we give up our cherished voluntary or mendicant hospital system, we shall have no alternative but that of State service, but this assumption is quite unjustified by the facts. There is no other country in which the voluntary hospital system is adopted to the same extent as in England. There are many countries in which the mendicant system does not exist at all, and in which a very nearly perfect hospital system does exist. Countries like Switzerland and Denmark have fine hospitals, but I suppose that in these it might be claimed that a State service is really responsible for them. But it is in the English-speaking countries, the United States of America, Canada, and other Colonies where modern hospital developments are most instructive to us. For all these places began with the English tradition of voluntary hospitals, but in all of them, although voluntary bequests for buildings and voluntary efforts in social service are utilised, yet in the main the finest hospitals in the world are maintained without resort to mendicancy and yet without State control. The guiding principles of these hospitals is that of making the institution one which admits all classes of the community and in which the middle-class patient pays for himself, whilst the rich patient not only pays for himself and the poor, but incidentally pays for the medical staff.

How to Overcome these Obstacles.

There are two obvious courses by which in England the evils of mendicancy can be abolished. One is by making the hospital suitable for all classes, and the other is by an extension of the insurance system, whether it is that effected by the State or that known as the contributory scheme.

There would still be a certain proportion of destitute persons who could neither pay for themselves and who were not insured. These would be paid for by the county or municipal authorities, as is now done when such patients have to be treated at the municipal hospitals. But many of the old hospitals which have invested endowments would be able to continue gratuitous treatment of indigent patients if once they were relieved of the unreasonable burden of treating the middle classes. To the really charitably minded persons who think that we ought to give hospital treatment freely to the genuinely destitute sick, the present system can afford but little comfort. For although the voluntary hospitals profess to be for poor people, yet in reality the pressure upon their accommodation is so great and financial stringency so urgent that the destitute person who cannot pay £1 a week is often pushed aside, whilst hospital beds are filled by tradesmen and professional classes. On the other hand, if the well-to-do and middle-class patient were adequately paid for by private fees or an insurance scheme, then the original funds bequeathed for the poor could be used for the purpose for which they were intended.

The patients who pay for themselves would also pay ordinary professional fees to the members of the medical staff who attend them. The staff would also receive a fixed salary in respect to the insured patients and those of no means, which would be met by money received from the insurance fund and from the profits made by the treatment of the paying classes. The practicability of this plan is beyond question because it is in actual existence in America, several of the Colonies, Switzerland, and elsewhere, although the financial details vary in each place. With us, the only real difficulty is the sentimental idea of the beauty and holiness of the voluntary system. I wonder how long this sentiment will survive the criticism of considered reason and the contemplation of the lengths to which mendicancy has been driven!

Appeals from the pulpit and from the press, through the wireless and at street corners recur with a wearisome monotony which makes us marvel that the term voluntary can still survive. Students and nurses are sent out to conduct a ribald harlequinade in the streets, in aid of the good cause, citizens are raided and held to ransom or offered the blackmail choice of purchasing an immunity ticket, the hoardings of the streets are covered by pitiful appeals, mechanical contrivances are set up in shop windows to lure subscriptions from the curious. A spotted dog offers to wink an eye for a shilling, or wag his tail for 2*s.* 6*d.* Lotteries, which the pious have declared to be immoral, are yet allowed in aid of this cause. Champagne supper parties are held at the ——— Club in aid of maternity charities! And all this in the name of sentiment, which is revolted at the idea of reducing the conduct of hospitals to a decent self-respecting matter, of well-to-do patients paying for themselves and middle-class patients being provided for by insurance.

The adoption of a self-supporting system instead of mendicancy would at once solve the difficulty of maintenance, and there would be enough margin, too, to cover the provision and replacements of apparatus, but it would not meet the need of new buildings. We have drifted so far behind the times in the present generation that there is a great need for new and modern buildings. Quite apart from the replacement of several small hospitals by one large one, of bad old buildings, in unsuitable sites by good new ones in good sites, the new hospital system would be obliged to provide many more beds, because if the artisan and his family are insured for hospital treatment, then this would have to be provided, so that the scandal of waiting-lists with people kept out of work for months and years whilst they wait for their turn for a hospital bed would have to be abolished forthwith. The capital outlay on building would have to be met out of county and treasury funds, as would only be proper for the execution of work which would give employment to many who are now on the dole. The hospitals should be like the universities, in receipt of State aid, which does not involve State control.

The Controlling Body.

But the solution of the financial difficulty by no means gives us any assurance of the ideal hospital system for which we are pleading. It merely removes the first and greatest hindrance to the realisation of our ideal. Once sweep away the mendicant principle, and then present hospital managers will no longer have any excuse or justification for behaving as though they controlled a proprietary institution. There will be no force tending to prevent hospital units from being organised into a hospital system. This raises a second great problem to be faced and that is the constitution of the controlling and directing body, which shall organise and supervise the hospitals. The Hospitals Advisory Committees, set up by the recent Act, might form useful local bodies, if once the voluntary hospitals gave up their independent position.

At present the committees are of unwieldly size. They contain representatives of all hospitals of the district, the majority being managers of voluntary institutions, whose first duty would seem to be to maintain the rights and prestige of the hospital they represent, rather than to evolve a system which shall serve the district as a whole. But in addition to the local committees there must be a central body under the guidance or control of medical experts, which shall be able to shape, direct, and supervise the hospital policy of the whole country. The Ministry of Health is not suitable to undertake this work any more than the medical officers of health are capable of undertaking all the responsibilities laid upon their shoulders by the Local Government Act. The Health Ministry represents experts in only one branch of the healing art—namely, that of preventive medicine. In the days of the war there was a council of consultants which worked in coöperation with the Army Medical Service. In like manner a council of consultants should be associated with the Ministry of Health, to direct the hospital policy of the country.

Only in this way will it be possible to adopt a progressive programme of reform, and to bring into one harmonious whole the big teaching hospitals, the municipal hospitals, the special hospitals, and the small hospitals in town or country districts. Every honest man, whether lay or medical, who has travelled abroad and seen hospitals in other countries must know that we have much ground to make up in respect of hospital construction and organisation, medical research and education. The demand for reform and advance should come from the medical profession, and not be forced upon the country by party politicians, nor be compelled by a mere breakdown of that voluntary system which once was a noble philanthropy, but which now has degenerated into an indecent mendicancy, unjustified either by morals or necessity.

IDENTIFICATION BY TEETH.

FIRE, injury, or decomposition often make bodies unrecognisable after death, and in these circumstances the teeth afford useful means of identification. They nearly always bear marks by which their owner can be distinguished; they are more resistant to destructive agents than any other structure, and are well protected. Dr. Alexander Klein,[1] of Vienna, says that a tooth which is suddenly exposed to intense heat will split into fragments, but if heated slowly it chars, the enamel cracks, and finally all organic components are destroyed, and only white ash is left. In the body, however, the overlying structures nearly always protect the teeth from complete destruction, especially when the victim of the fire, though unrecognisable through smoke and scorching, is not calcined. Moreover, fire spares most of the work of the dentist. According to the work of Wachholz and Lepkewski, quoted by Klein, amalgam and gutta-percha disappear completely, but gold and platinum remain unaltered. Phosphate and silicate cement fillings retain their shape and consistency, and are merely blackened; porcelain, metal plates, crowns, and bridges are unharmed.

Apart from dentistry there are many distinguishing marks a mouth may bear; few persons have no gaps, almost everyone has some teeth which are not in their right position or of the right height, and a certain small percentage have definite malformations, such as fused and supernumerary teeth or peg-teeth. It is obvious that the chief value of this method is to verify or contradict a suspicion. Klein, in an interesting if somewhat discursive account of the Ringtheater disaster of 1881, relates that a mere description of the teeth enabled the relatives to identify some of the corpses, but when there is one calcined body and it is desired to know whether it is or is not that of a particular person, the dentist can nearly always clinch the matter beyond doubt.

Klein adds another to the stories of detection which depend on examination of the teeth. A diplomatic official in Chile complained of threatening letters, and one night the embassy was burnt down and his charred body was found in the ruins and buried with great public lamentation and eulogy. The director of the Chilean dental school had his doubts and examined the jaws of the corpse an hour before burial. The next day he announced that the deceased was not the missing official; within a few days the latter was arrested on the frontier with the whole negotiable wealth of the embassy. The body was that of the night porter, who had never been to the dentist: although the murderer had been to particular pains to mutilate the teeth, they were easily distinguishable from his own as described in his dentist's records.

[1] Schweiz. Monats. f. Zahnhk., 1929, xxxix.

RED NOSE.

THIS distressing stigma, which is hardly mitigated by calling it erythema nasalis, has many origins. Dr. J. C. Warbrick enumerates[1] 13 causes which could be more conveniently classified as (1) local or intranasal, (2) reflex, as in rosacea, and (3) metabolic, as in renal and cardiac cases.

Any intranasal abnormality, whether mechanical or infective, or both, can give rise to passive congestion which in a terminal and exposed structure such as the nose will soon cause manifest and disturbing symptoms. The patient should be questioned about signs of nasal obstruction and referred to a rhinologist if there is evidence of such common conditions as a deflected nasal septum, chronic nasal catarrh, mucous polypi, or furunculosis in the atrium nasi.

Reflex causes are probably the most common of all those responsible for the red nose. A history of dyspepsia—associated, according to some authorities, with pronounced hypochlorhydria—and of concomitant facial flushing, can often be elicited and may explain the condition at once. There is no doubt that disorders of the uterus and adnexa are sometimes at the bottom of the symptom. Alcoholic excess, again, is an undoubted cause of erythema nasalis, but its existence is seldom admitted by the patient—probably because people whose red nose is a result of alcoholism do not usually bother to ask a doctor about it. Dilated veins are most apt to recur in this "reflex" group.

In the metabolic category we should have to consider such factors as the "chilblain circulation." In these cases the patients are mostly young girls with blueish rather than red noses. Cardiac and renal back-pressure may play a part in causation, but such cases are not likely to present themselves for the disfigurement alone. Dyspepsia due to a gouty diathesis or hepatic dysfunction—not necessarily causing hypochlorhydria—may explain why an apparently normal gastric content is sometimes revealed on analysis. Constipation, doubtless, acts in a similar way, and it always needs attention when present.

A recurrent cutaneous infection, such as a low-grade erysipelas, although difficult to imagine in a form localised to the nose, is mentioned by Warbrick. There is also the possibility of localised infection of the sebaceous glands, with or without acne, and that exceedingly rare affection of the adolescent youth known as hyperidrosis rubra nasi. Adenoma sebaceum, first classified by Pringle, and sometimes associated with a deficient mental development, is in the nature of a nævus and confined to girls.

These are the main causes of a red nose, although the list is by no means exhausted. The symptom may be part of a seborrhœic tendency, with erythema and greasiness of the nasolabial sulcus and a scurfy scalp. It can also occur as part of the clinical picture in lupus erythematosus, psoriasis, and lupus vulgaris. It follows that all who aspire to success in treatment must possess a fairly extensive knowledge in the domain of general medicine, as well as the special experience that can only be acquired in the out-patient department of a dermatological clinic.

GIDEON MANTELL.

ON May 8th, at a house in Old Steine, Brighton, a tablet was unveiled bearing the following inscription:—"Here lived from 1833 to 1838, Gideon Algernon Mantell, Geologist." Besides being one of the pioneers of geology, Gideon Mantell was a medical practitioner. Born at Lewes, he served there an apprenticeship to a surgeon named James Moore, and afterwards qualified at St. Bartholomew's Hospital. Returning to Lewes, he practised medicine for 20 years, and at the same time carried on exhaustive researches in the surrounding district. He published a volume entitled "The Fossils of the South Downs, and the Geology of Sussex." He made a great collection of fossils and geological remains, and these were acquired by the British Museum. In 1833, Dr. Mantell was induced to go to Brighton in the hope that he would find easier conditions of practice, but he did not succeed, and died in 1852. The tablet was unveiled by Sir Arthur Smith-Woodward, who, as a former keeper of the geological specimens in the British Museum, had for 42 years Dr. Mantell's collection of fossils under his care.

STAINS ON THE HANDS.

Prof. Paul Delmas, of Montpellier, advises[2] the use of commercial ammonia, diluted to one half or one quarter with water, for the removal of iodine stains from the hands' after the first intensity of the discoloration has been reduced with alcohol. The stains turn a rusty black, and subsequently disappear. Bloodstains, which are occasionally persistent on the hands, can be removed by washing in a solution of tartaric acid and warm water.

[1] Amer. Med., 1929, xxxv., 559.
[2] Quoted in Semaine Dentaire, April 20th, p. 596.

HOSPITAL STAMPS.

Mr. A. G. Galloway writes: The recent appeal for foreign postage stamps to be sold in aid of Charing Cross Hospital recalls the part philately has played in assisting other medical causes. There have been many special issues of stamps sold for the benefit of charity at a price above their face value. Thus as long ago as 1897 New South Wales and Victoria both issued two special postage stamps which although possessing franking powers of only 1*d.* and 2½*d.* were sold for 1*s.* and 2*s.* 6*d.*, the difference going towards a home for consumptives. Many of the smaller British colonies, such as the Bahamas, Jamaica, and Trinidad, have either had Red Cross stamps or have issued semi-official labels. A unique method of collecting funds was adopted by South Africa in 1918, when for two months special aeroplane flights were made round the Cape of Good Hope and in the Transvaal, souvenir cards being sold at 6*d.* each, bearing the inscription "By Aerial Post—make your Sixpence Fly."

It is, however, in foreign countries that we find more elaborate methods to assist the Red Cross cause. In Belgium in 1914 a handsome set of postage stamps was placed on sale at Antwerp; but they had only a brief existence, for they appeared but two days before the German occupation. In 1928 a complete set of pictorial stamps bearing views of the Belgian Cathedrals was issued in that country for the benefit of the Anti-Tuberculosis Fund. Apart from producing several charity stamps, France has lately recognised bacteriology by putting the portrait of Pasteur on a number of her recent issues.

"THE T.B. PATIENT'S GUIDE."

Dr. F. J. C. Blackmore, who, as tuberculosis officer for the Metropolitan Borough of Woolwich has great experience in the management of consumptive patients, has long been aware that many failures in treatment are due to the fact that the patient fails to appreciate the gravity of the disease until it has reached an advanced stage. In a little book recently published[1] he has succeeded in warning the patient against possible dangers without being unduly alarming. The reason for various methods of treatment is described, so that the patient can understand why he should rest in one stage and work or take exercise in another. In a chapter on complications, hints are given for dealing with night sweats, indigestion, insomnia and other troubles. Advice on clothing, food, employment, and the general mode of life is also given. The tuberculous patient who wishes to work in coöperation with his doctor without worrying him with too many questions will appreciate the information here set out.

PROGRESS OF CONTRIBUTORY SCHEMES.

AT a county conference in connexion with the Norwich hospitals contributory scheme it was decided that, in view of the increasing needs of the many institutions aided by the scheme, it is desirable to make the minimum contribution 2*d.* instead of 1*d.* The scheme, which started in 1919 with an income of £600, last year produced £30,000. It was argued that only in this way can long waiting-lists be avoided.—The annual report of the Royal Buckinghamshire Hospital, Aylesbury, shows that the income of the contributory scheme has increased from £804 in 1923 to £4176 in 1929.—A voluntary hospitals council has been established at Hull composed of representatives of all the local hospitals and dispensaries, which is putting into operation a contributory scheme on the now familiar model. Contributions are twopence or threepence weekly, according to wages, and should a member fall ill while away he will be treated at the local voluntary hospital at the cost of the fund. It is hoped to obtain an income of £55,000 a year.

CONTINENTAL LABORATORIES, LTD., of Lower Belgrave-street, London, S.W., inform us that their address from May 19th will be 30, Marsham-street, S.W.1. (Tel.: Victoria 2041).

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[1] London: Cassell and Co., Ltd., 1930. Pp. 76. 1*s.* 6*d.*

A MEMORIAL COTTAGE HOSPITAL.—The Haddington Vert Memorial Cottage Hospital was recently formally opened by Mr. John Vert, of Pendleton, Oregon, U.S.A., a native of the town, and the son of a former provost, and the donor of £10,000 towards the cost of its erection and equipment. The hospital, which will serve a dozen surrounding parishes, is built of red sandstone obtained from the demolition of Amisfield, a former residence of the Earls of Wemyss, about a mile from Haddington. It is primarily a memorial to Mr. Vert's parents, but a wing will be known as the Elcho Ward, in memory of the eldest son of Lord Wemyss, who fell in the war; the Jessie McLean ward commemorates Mr. Vert's late wife. There are, in addition, a maternity ward, two private wards, and a theatre.

The Linacre Lecture

ON

THE AUTONOMIC NERVOUS SYSTEM:

AN INTERPRETATION.

Delivered at Cambridge on May 6th, 1930,

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THERE is a distinctive appropriateness in considering here at Cambridge some recent developments of our knowledge of the autonomic nervous system and its interpretation, for here the firm foundations of our knowledge of that system were laid. The careful researches of Gaskell, and of Langley and Anderson—how readily the names are spoken, so often did they appear together in published papers!—the careful researches of these physiologists taught us not only the physiological effects of autonomic nerve impulses, but also the morphological organisation of autonomic neurones. Indeed, the names which they, as pioneers, devised to designate both the new structures and the new functions which they discovered have gone forth from this place and are now employed throughout the world. It was a difficult and intricate problem which confronted them. Happily, their investigations went far towards untangling the complex maze of fibres and responses to stimulation, so that later workers in this realm of physiology have had relatively easy tasks.

In the organisation of the autonomic system a number of features are so peculiar that they at once attract attention and challenge explanation. First there is its field of influence, its typical government of the activities of smooth muscles and glands; and associated therewith the intercalation of an extra neurone between the central nervous system and the peripheral organ. What is the significance of the outlying neurone? Again, there is the arrangement of the connexions between the outlying neurones and the brain and spinal cord in three divisions; and commonly associated therewith a double innervation of the peripheral organs, one nerve-supply from the mid-division and another from either of the end divisions. Why this double innervation? Furthermore, there is the striking fact that the mid, or sympathetic, division can cause the discharge of an internal secretion, adrenalin, which in nearly all respects is capable of producing the same effects on the peripheral organs as the sympathetic nerve impulses themselves. What is the service of adrenalin? And, finally, there are the special conditions under which the several divisions of the autonomic system are brought into action. What do these natural modes of stimulation indicate as to the uses of the autonomic system in the organism? I propose that we discuss these questions.

THE SIGNIFICANCE OF THE OUTLYING NEURONES.

First, then, the question as to the significance of the outlying neurones. It appears certain that one function of these structures is to multiply the channels of distribution. Ranson and Billingsley have counted in the cat the number of pre-ganglionic fibres in the cervical sympathetic trunk and the number of cell bodies in the superior cervical ganglion and they report that the ratio is as 1 to 32. Obviously, if a similar relation exists generally, any single pre-ganglionic axone would bear impulses having extensive effects because of the multiplicity of its contacts with the final distributing agencies.

But does multiplication of the discharging paths tell the whole story? Is there not perhaps a service which the intercalated neurones perform that is peculiarly related to the tissues which they affect? Smooth muscle, for example, rarely responds to a single brief stimulus, though that is highly effective when applied to skeletal muscle; and furthermore, smooth muscle has a much longer latent period and a much slower contraction than skeletal muscle. May not the nerve impulses as discharged from the central system be quite appropriate for skeletal muscle but not for smooth muscle? And may not the outlying neurones, which differ in some respects from all other neurones in the body, act as "transformers," modifying the impulses from the central source and adapting them to the peculiar tissues which they innervate?

This suggestion, put forth about sixteen years ago, was the subject of an investigation in the Harvard Physiological Laboratory by Querido. Using as a test structure the smooth muscle of the nictitating membrane of the cat's eye he found that frequencies of stimulation above and below a certain effective range, when applied to *post*-ganglionic fibres, had no effect or caused submaximal contraction, whereas stimuli of the same frequencies, when applied to *pre*-ganglionic fibres, caused a maximal response. The conclusion was drawn, therefore, that impulses of widely varying frequencies, started central to the ganglion, induce there impulses which pass to the smooth muscle at an optimum frequency. This conclusion was checked by cooling the nictitating membrane and thereby slowing its response. Stimulation of *post*-ganglionic fibres could then be made effective, but only by selecting a frequency of the impulses which was much below the usual optimum. Under those conditions, when the *pre*-ganglionic fibres were stimulated, it was found that no matter what the rate of stimulation, the membrane failed to respond. It is difficult to explain this result except in terms of a relatively fixed frequency of discharge of nerve impulses from the ganglion in response to varying frequencies of impulses coming into it—a frequency of discharge which under the circumstances was too high for the cooled muscle.

Although the results obtained by Querido appear to be clear-cut and decisive, they have been criticised by Veach and Pereira. Contrary to Querido, they obtained the same responses from the nictitating membrane, on both *pre*- and *post*-ganglionic stimulation, with impulses ranging in frequency from 3 to 142 per second. Veach and Pereira did not, however, follow exactly Querido's method, which permitted rapid comparisons back and forth between the two stimulated regions. Also, they did not conduct their investigation by varying the rate of a continuous stimulation, as Querido did, but employed periodic stimulation at the different rates—a method which Querido tried and discarded because it yielded results dependent on the length of stimulation. That point Veach and Pereira seem not to have carefully regarded. They showed, to be sure, that as induction shocks become more frequent they may become less effective because of overlapping, and they suggested that the lessened efficacy of high rates of stimulation in Querido's experiments may have been due to such effects; they did not note, apparently, that Querido explicitly stated that he had ruled out the possibility of that error by "galvanometric control"; further, they did not account for the differences which Querido found between pre- and post-ganglionic stimulation with the *same* frequencies, *whether fast or slow;* and although they proved that the overlapping effect can be overcome by increasing the strength of the primary current they seem not to have noticed that when Querido did precisely *that* the maximally effective frequencies were not raised but lowered. These tedious but pertinent details, though presenting a strong presumption in favour of Querido's results and inferences, still indicate that the question at issue is not settled, and that a clear verification is desirable.

It is surprising that Querido and also Veach and Pereira report that the optimum rate of stimulation of post-ganglionic fibres lies between 120 and 160 impulses per second. That rate is considerably higher than the maximum reported by Adrian and Bronk for the natural discharge of motor impulses to skeletal muscle. In an economical system it would appear that less rapidly acting smooth muscle might well be excited by less frequently recurring nerve impulses, and the less rapid conduction in post-ganglionic fibres, as compared with conduction in motor fibres of skeletal muscle, as well as the longer chronaxie, the longer absolutely refractory period and the longer duration of the action potential, reported by Heinbecker, is in accord with that idea. On the other hand, Kleitman and Chauchard's contradictory observation that the chronaxie of post-ganglionic fibres is much shorter than that of pre-ganglionic fibres could be significant of a more frequent discharge along post-ganglionic axones. We really ought to have, however, direct evidence on this point under natural conditions.

In the present state of our knowledge of the nature of nerve impulses in the autonomic system no decisive conclusion can be drawn regarding the possible function of the outlying neurones as "transformers," adapting the nerve impulses received from the brain and spinal cord to the peculiar visceral structures which are affected. More information is needed. May I venture the suggestion that here lies an attractive realm for research, which may yield highly interesting new facts.

The Double Nerve-supply to the Viscera.

As you have already been reminded, the viscera not uncommonly have a nerve-supply from two sources, from the mid- or sympathetic division of the autonomic system and from the cranial or sacral division. In the management of a skeletal muscle—the biceps, for example—it is quite possible to have all variety of change from extreme contraction to total inhibition by regulating the impulses which pass along its single nerve. Why not a similar control of an internal organ by way of a single nerve supplied to it? A possible answer to this puzzling question can be found by examination of the differences between the distribution of the pre-ganglionic fibres of the sympathetic division on the one hand and of the cranial and sacral divisions on the other.

The pre-ganglionic fibres of the sympathetic division pass out to two rows of ganglia lying each beside the vertebral column. These fibrès give off branches to the cell bodies in the first ganglion which they reach, and then they continue to neighbouring ganglia, and thus they form the connexions of the so-called sympathetic "chain." At each successive ganglion the fibres passing through it give off branches to the cell bodies of the outlying neurones. This arrangement provides a highly effective device for multiplying contacts with discharging channels. But it does more than that. The overlapping connexions of the pre-ganglionic fibres, as distributed to the sympathetic ganglia, are such as to result in a *diffuse* discharge of nerve impulses. This view of the mode of action of the sympathetic division is supported by common observation. When a cat, for example, is subjected to excitement or to exposure to cold—conditions which call the sympathetic into action—its hairs are erected from head to tail tip. Deeper observation reveals that the general erection of the hairs is indicative of other general effects on large systems, such as inhibition of the activities of the digestive canal and constriction of blood-vessels. The view that the sympathetic division is organised for diffuse discharge of nerve impulses is confirmed also by the fact that sympathetic impulses evoke a secretion of adrenalin from the medullary portion of the adrenal glands. Since this substance is highly potent in producing, as a rule, the same effects in the organism as sympathetic impulses, and since it has a general distribution in the blood stream, it is clear that, if the sympathetic did not have diffuse effects by other means, it would have them by way of adrenalin. The two factors, however—the nerve impulses and the hormone—commonly work together, as a sympathico-adrenal system, to produce widespread changes in smooth muscles and glands throughout the organism.

How different is the organisation of the cranial and sacral divisions. Here the pre-ganglionic fibres reach into or end near the organs which they affect, and the outlying neurones are merely local agents. Like the nerves supplied to skeletal muscles, therefore, the bundles of pre-ganglionic fibres in the cranial and sacral divisions are distributed in a manner favourable to separate and discriminating action. Thus, constriction of the iris, by discharge through the *motor oculi* when the light is strong, is not associated with an increased salivary flow produced by discharge through the *chorda tympani*, nor with slowing of the heart and increased tone of the alimentary tract by involvement of vagal activity. These various functions of the cranial autonomic nerves can be carried on quite independently of one another—indeed, there is little or no evidence of a diffuse discharge of impulses in them, such as is seen in the complex of nerves forming the sympathetic division.

Associated with the double nerve-supply to the viscera is the interesting fact that, as a rule, the two nerves are opposed in action. Thus, as you well know, the sympathetic influence on the heart is acceleratory, the vagal influence inhibitory; the sympathetic lessens the muscular tension of the stomach, and vagal stimulation increases it. Now, by means of the general *diffuse* action of the sympathetic division and the opposite *particular* action of the several nerves of the cranial and sacral divisions every variety of change is provided for both locally and temporally. *All* the viscera can be affected *simultaneously* in one direction or the other by varying, up or down, the tonic activity of the sympathetic division. And any *special* viscus can be *separately* affected in one direction or the other by varying, up or down, the tonic activity of the special nerve of the opposed cranial or sacral division that is supplied directly to the viscus. The sympathetic is like the soft and loud pedals, modulating all the notes together; the cranial and sacral innervations are like the separate keys. When we consider that the sympathetic, in emergencies, serves in a great variety of ways to preserve the stability of the organism, if that is threatened, the importance of its arrangement for simultaneous and unified action becomes evident.

The Service of Adrenalin.

As already emphasised, the general distribution of adrenalin in the blood stream would assure a general influence of the sympathetic division even if the neurones of that division were not so arranged as to broadcast impulses everywhere, simultaneously, throughout the organism. But the question has been raised, is extra adrenalin discharged into the circulation on special occasions and in amounts which influence the viscera? Over that question sharp controversy has raged for many years. Stewart and Rogoff, although admitting that splanchnic stimulation causes an extra discharge of adrenalin which can affect the viscera, have contended that normally the rate of discharge is fixed, and that it is not altered by asphyxia, afferent stimulation, or emotional excitement—natural conditions which cause splanchnic stimulation. And Gley and Quinquaud, after presenting evidence that the output can be varied—by asphyxia, for example—have declared that adrenalin does not reach the viscera in sufficient concentration to produce any physiological effect. It would be impossible to elaborate, on this occasion, a critique of that long polemic. That I have recently done (in an article in the *Ergebnisse der Physiologie*), and anyone may read the review. It is perhaps sufficient to state here that our claim for a discharge of adrenal secretion in pain and asphyxia has been supported by other investigators, who have used various methods, in England, Russia, Algeria,

Argentina, the United States, and Japan. No one has yet appeared who has confirmed the conclusion of Stewart and Rogoff that the secretion of adrenalin is uniform and invariable. Indeed, Japanese investigators, who have employed the method which Stewart and Rogoff employed, have confirmed our results. And furthermore, when we showed that asphyxia and afferent stimulation caused acceleration of the denervated heart, if the blood flow from the adrenal veins was uninterrupted, but did not do so if the flow was blocked, we used the same procedure which Stewart and his collaborators used to prove that the output of adrenalin is increased by splanchnic stimulation. Logically, therefore, they must either accept our evidence that asphyxia and afferent stimulation augment the output or surrender their own evidence that splanchnic stimulation augments it, Though our evidence was published about eight years ago, Stewart and Rogoff have not yet resolved the dilemma which was presented to them. I see no other conclusion to draw from the evidence in hand than that afferent stimulation, asphyxia and emotional excitement—as well as cold and hypoglycæmia, as we shall see—cause a quick and abundant secretion from the adrenal medulla.

There are many observations which prove that adrenalin reaches the viscera in amounts or concentrations capable of influencing them. The effects of extra adrenal secretion on the denervated salivary gland, iris, heart, and kidney, and in experiments with a crossed circulation, need only to be mentioned to recall to your memories the wealth of this evidence. Indeed, Gley has himself admitted an "adrenalinemia" of an effective character. That aspect of the controversy, therefore, appears to be settled in principle.

Granted that adrenalin is produced in extra amount under special circumstances, what services does it perform? First, as is generally admitted, adrenalin coöperates with sympathetic impulses to produce the same effects which they produce. Though in some conditions the impulses can induce the changes quite as obviously without the aid of circulating adrenalin as with it—on the heart and blood-vessels, for example—the evidence is not yet clear that the impulses normally produce maximal effects without that aid or that they are not materially supported by it. There are indications also that circulating adrenalin prolongs the effects of sympathetic activity. We have reported a continued acceleration of the denervated heart, during nearly a half hour after one minute of excitement, although the animal, after the momentary disturbance, was resting serenely on a cushion. Furthermore, there are observations that in some respects the secreted adrenalin has an efficiency far beyond that of the sympathetic impulses. For example, asphyxia, reflex stimulation, normal emotional excitement, and the sham rage which follows decortication of the cerebral hemispheres, are associated with hyperglycæmia. This is fully as great in animals with the liver nerves severed and with the adrenal glands undisturbed as it is in animals normal in that respect. On the other hand, if the adrenal glands are removed or inactivated and the liver nerves left intact, the hyperglycæmia is diminished or entirely lacking. Quite possibly the action of adrenalin in causing a faster coagulation of the blood and a faster metabolism, as well as its influence in abolishing the effects of muscular fatigue, is wholly independent of any coöperation with sympathetic nerve impulses. The relative services of adrenalin and the nerve impulses need to be studied further, however, before their respective rôles in the functioning of the viscera can be assigned.

The General Services of the Autonomic System.

As suggested earlier, we are likely to obtain insight into the various functions of the autonomic system in the organism by considering the special circumstances under which its several divisions are brought into action and also the special effects which each produces. We shall survey the three divisions separately.

The Sacral Division.—The functions of the sacral division may be summarised by the statement that they consist of a group of reflexes for emptying hollow organs which are periodically filled. Thus, sacral autonomic impulses cause contraction of the rectum and distal colon and also contraction of the urinary bladder. In both instances the effects are induced reflexly by a stretching of the tonically contracted viscera by their accumulating contents. Distension of the seminal vesicles, though associated with more elaborate reactions, stimulates the *nervi erigentes* of the sacral division, and may thereby result in behaviour which reflexly leads to a discharge of the accumulated fluid. To what degree the contractions of the distended uterus can be brought into this scheme is not quite clear. According to Langley and Anderson the sympathetic, not the sacral, division innervates the uterus. The fact that parturition can occur normally in the absence of the sympathetic division indicates either that there is an intrinsic government of uterine contractions which is quite adequate, or that there are influences working by way of sacral fibres which have not yet been traced.

Although simple distention, and reflex response thereto, is the commonest *modus operandi* of the sacral division there are other ways in which it is roused to action. Great emotion—fear, for example—which is attended by nervous discharges through the sympathetic division may be attended also by discharges over sacral pathways. The involuntary voiding of the bladder and lower gut in times of intense excitement is a well-known phenomenon both in man and other animals. And the power of sights and odours and libidinous thoughts to disturb the region controlled by the *nervi erigentes* shows that its function is subject to its own special affective states.

Cranial Division.—The functions of the cranial division, like those of the sacral, can be summarised as mainly a group of reflexes—reflexes protective, conservative, and up-building in their service. By narrowing the pupil of the eye the cranial division protects the retina from excessive light. By providing for the flow of saliva and gastric juice and by supplying the muscular tone necessary for the periodic contractions of the alimentary canal it assures the essential basis for proper digestion and absorption of the energy-yielding material required for all bodily activity. By vagus control of insulin secretion it may play a rôle in the storage of glycogen in the liver. Further evidence of its conservative value is seen in the assurance of time for rest and recuperation of cardiac muscle by the tonic vagal slowing of the heart-rate.

The cranial division, like the sacral, has uncomplicated reflexes, such as the narrowing of the pupil, and likewise activities associated with affective states. The pleasurable taste and smell of food are accompanied by the so-called "psychic" secretion of the digestive juices, and by a tonic contraction of the stomach and intestines. Furthermore, the two divisions—sacral and cranial—are similar in being largely subject to interference by striated muscle. Contraction of the bladder and rectum can be aided or frustrated by impulses from the cerebral cortex, much as the reactions of the pupil can be induced or modified by voluntary acts. Indeed, as a rule, the workings of the sacral and cranial divisions involve the coöperation of the cerebro-spinal nervous system to a much greater degree than do the workings of the sympathetic division, because they are much concerned with external orifices surrounded by striated muscles.

Sympathetic Division.—As preliminary to the discussion of the services of the sympathetic division to the organism I wish to recall a signal contribution to physiology made by Claude Bernard about 70 years ago. He pointed out that we do not live in the atmosphere that surrounds us—we are separated from that atmosphere by a layer of dead cells or by a film of mucus or of salt solution. All that is alive within these lifeless surfaces is immersed in the fluids of the body, the blood, and the lymph, which form an internal environment. Striking instances of the

dangers which arise when the internal environment, or *fluid matrix*, is markedly altered clearly demonstrate the primary importance of keeping it as constant as possible. A relatively small rise of body temperature, a reduction of blood sugar to half its common percentage, a shift of the pH of the plasma slightly up or down, may be attended by disaster. As Claude Bernard explicitly stated, the preservation of constancy is the condition for free and independent life. A glance at lower vertebrate forms reveals the truth of that statement. The amphibian, for example, is not free in either water or air; if it remains in water it asphyxiates; if it remains in air it desiccates. Furthermore, it cannot control its temperature, and therefore it is rendered inactive by the onset of winter. The next higher forms, the reptiles, are likewise dependent on external warmth for their activity. When winter approaches they become cold and sluggish. They have, however, acquired the ability to retain the bodily fluids and therefore can move away from water sources without promptly drying. In still higher forms, in birds and mammals, not only are bodily fluids readily conserved, but the temperature is maintained at a fairly constant optimum level. It is evident that in the course of evolution the internal environment has come more and more under control of agencies which protect it and keep it constant, and that concomitantly the evolving organisms have become more and more independent of the shifts of outer circumstance.

Freedom from External Influences.

Bernard and others laid particular emphasis on this freedom from *external* influences which is provided by assuring constancy of the fluid matrix of the body. It is well to recognise that as control of the fluid matrix is gradually attained the organism is freed not only from variations in the outer world, but also from disturbances arising from the intrinsic activities of the organism itself.

The comfortable and liberating constancy, or *homeostasis*, of our internal environment is secured only by the operation of nice devices which normally are ready at all times to prevent catastrophe. A brief survey will reveal the nature of these devices. External injury may open blood-vessels and allow the fluid matrix itself to escape. Coagulation of the blood appears, however, as a conservative agency. And by reason of pain, or the partial asphyxia which results from hæmorrhage, the sympathico-adrenal system is roused to action; thereby the efficacy of coagulation as a means of stopping the hæmorrhage is increased by an acceleration of the clotting process. If, perchance, hæmorrhage occurs to such a degree that there is considerable loss of blood, the sympathico-adrenal system is further serviceable; it constricts the peripheral vessels, thus diminishing the flow in regions where the bleeding is likely to be great, and thus assuring, also, a continuous supply of blood to essential and constantly active organs, the brain and the heart.

Again, there may be external cold which withdraws heat from the organism and thereby threatens a lowering of the temperature of the internal environment. The sympathico-adrenal system promptly acts to check the danger. It constricts peripheral blood-vessels and thereby lessens the exposure of warm blood to the surface. It causes erection of hairs and feathers, in animals provided with these means of protection, so that a layer of poorly conducting air surrounds the body. Furthermore, by discharging adrenalin into the circulating blood it increases the speed of the oxidative processes at a time when extra heat is needed to keep the temperature from falling.

Or there may be a reduced oxygen supply to the organism, either because of resort to high altitudes, or because of hæmorrhage, or because of the action of poisons, as, for example, carbon monoxide. Once more the sympathico-adrenal system comes to the support of homeostasis. The heart is made to pump the blood more abundantly into constricted vascular areas in the splanchnic and peripheral regions, the blood pressure rises, and the flow becomes faster in essential and sensitive structures. In addition, as Barcroft has so beautifully proved, the spleen is made to contract and discharge myriads of extra red corpuscles for the service of the organism. By these activities of the sympathetic system what might be a serious disturbance is minimised to an important degree.

As I have mentioned above, however, homeostasis of the fluid matrix of the body may be altered not only by external conditions, but also by internal conditions, which, if not guarded against, result in profound disorders. Among the disturbing internal conditions vigorous muscular work stands forth prominently. Let us review the changes caused by intense labour and see how they are prevented from altering the fluid matrix.

Prolonged muscular activity, such as running, markedly reduces blood-sugar, and may deplete the liver of its store of glycogen. The blood-sugar must not be permitted to fall to a dangerous degree—if it is reduced to about 45 milligrammes per cent. (as shown by extirpation of the liver or by use of insulin) convulsions result; and if the reduction is not checked, coma and death follow. Before the convulsive stage is reached, however—and even in the absence of muscular work—the sympathico-adrenal system is brought into operation and sugar is liberated from storage. And so much sugar is thus set free that, if the condition producing hypoglycæmia is not overwhelmingly effective, the danger is passed, and then the sympathico-adrenal system subsides into inactivity. Thus, in spite of great demands for sugar from labouring muscles the glycæmic level is assuredly maintained above the region of serious danger.

Vigorous muscular activity is associated with the development of heat. In prolonged and supreme effort, when the great muscle masses of the body are employed, the amount produced may be very large. Unless this extra heat is dissipated, the temperature of the internal environment may rise to a perilous height. As a consequence of exertion temperatures in man have risen as high as 40·5° C. A rise of two degrees more, if prolonged, might bring serious results because of effects on sensitive cells in the brain. As an automatic protection against that danger the sympathetic system is called into service. Peripheral vessels are relaxed, sweating becomes profuse, and the discharge of heat is greatly accelerated. Thus, a rise of temperature is quickly met and counteracted and the harmful effects of hyperthermia are obviated.

When one engages in strenuous muscular work there is a tendency for the reaction of the blood to shift towards the acid side of neutrality, as a consequence of the metabolites resulting from contraction. This appearance of acid is not without danger. As is well known, in pathological states a condition of acidosis may develop to such an extent that the functions of the nervous system are impaired, and, if the situation is not rectified, coma and death supervene. Long before that stage is even approached, as an effect of muscular effort, corrective and protective processes are started and are vigorously maintained. The important features in the strategy are, first, a prompt supply of extra oxygen to burn non-volatile lactic acid (which otherwise persists and makes trouble in the blood) to volatile carbonic acid which can be rapidly discharged; and second, a faster and deeper breathing so that carbon dioxide is driven away from and extra oxygen is drawn into the lungs. In short, the circulatory and respiratory mechanisms must work at their maximal capacity. Again, the sympathico-adrenal system steps in and saves the fluid matrix from grave disturbance. The circulatory adjustments—constriction of the splanchnic vessels, acceleration of the heart, discharge of extra corpuscles from the spleen—are all made by means of the sympathico-adrenal system. And in addition, this system probably plays a rôle in facilitating the respiratory processes, for, as has been

demonstrated, it can quickly and effectively cause dilatation of the bronchioles and thus reduce the frictional resistances of the to-and-fro movement of the respired air. By these various services the sympathico-adrenal system helps greatly to preserve the homeostasis of the acid-base relationship in the blood, at times when it is dangerously threatened.

The foregoing survey has shown that not only states of the *external* environment itself, but *responses* of the organism to situations in the external environment, are associated with disturbances of the *internal* environment. This personal, individual climate, which we each carry about with us, must not change if we are to continue to be effective. In order that the constancy of the internal environment may be assured, therefore, every considerable change in the outer world and every considerable move in relation to the outer world, must be attended by a rectifying process in the hidden world of the organism. The chief agency of this rectifying process, as we have just noted in many illustrations, is the sympathetic division of the autonomic system.

Removal of the Sympathetic Division.

Having laid emphasis on the great importance of the sympathetic, or sympathico-adrenal mechanisms, may I now tell you something about the physiology of animals from which this part of the autonomic system has been removed. The aggregation of the nutritive centres (the cell bodies) of the outlying neurones in ganglionic chains, especially in the chest and abdomen, where direct connexions with the spinal cord are present, permits a thorough extirpation of the sympathetic division. If the ganglia are removed, the post-ganglionic fibres must degenerate. And, as Langley showed, the pre-ganglionic fibres, coming from the central nervous system, are incapable of making effective connexion with organs normally innervated by post-ganglionic fibres. Removal of the sympathetic chains, therefore, must result in a permanent disconnexion of these organs from central nervous control.

In removing the sympathetic chains we have used two methods. At first we took out the cervical, the thoracic, and the abdominal portions separately. The defect of that method lay in an occasional failure to excise one or two ganglia in the lower thorax, close to the diaphragm. To avoid that possibility we later removed the thoracic and abdominal portions, from the stellate ganglia to the ganglia beyond the rim of the pelvis, in an unbroken condition. There is no possibility of question that the entire sympathetic system, as a functioning agency, is thus extirpated. The qualification, "as a functioning agency," is used because the cervical sympathetic still remains in place. The pre-ganglionic fibres for the cervical sympathetic ganglia, however, pass through the stellate ganglia on either side, and consequently the removal of the stellates necessarily disconnects the cervical ganglia from the central nervous system. That the cervical sympathetic ganglia do not function under these circumstances is proved by extirpating the stellate on one side, and later exciting the animal or exposing it to cold. The hairs rise on only one side of the head; they do not rise on the side deprived of its stellate, although they are still innervated by the post-ganglionic fibres from the isolated cervical ganglia. It is clear, therefore, that removal of the thoracic and abdominal portions of the sympathetic strands over the range of their connexions with the spinal cord completely eliminates sympathetic control of the viscera.

The first fact which strikes the observer of sympathectomised animals—cats, dogs, and monkeys—is that they continue to live without apparent difficulty. It is immediately surprising that the so-called "Lebensnerven" can be so largely destroyed without producing marked and obvious changes and definitely jeopardising existence. Numbers of these animals have lived many months, some more than a year, before being sacrificed; and one of them, now comfortable in the laboratory, has had no effective sympathetic system since Oct. 10th, 1927.

These facts definitely contravene certain views, put forth by previous workers, concerning the importance of some parts of the system. Meltzer, for example, removed the superior cervical ganglia from rabbits and cats, and because of the very high mortality he concluded that those ganglia contain a principle which is essential for the maintenance of life. His views receive no support from our observations. Later Spadolini declared that complete and extensive extirpation of the mesenteric nerves of the cat is incompatible with continued existence. He observed a general depression in his animals, grave wasting, the lowering of body temperature, and severe lesions of the gastro-intestinal tract. Although we have removed the abdominal sympathetic chains, including the splanchnic nerves, from more than one hundred cats, and although we have taken from some of them the semilunar ganglia and have even stripped the nerve strands from the cœliac axis and the superior mesenteric artery, we have never seen any serious symptoms as a consequence of the procedure. Finally, Abel has urged that chromophil tissue—possibly that which is associated with sympathetic ganglia—is essential to life. We have, however, removed all the sympathetic ganglia from the superior cervical to the pelvis, we have dissected out the semilunar ganglia, we have excised the right adrenal gland and sucked away the left adrenal medulla. The animal lived thereafter in evidently normal health for many months. At autopsy there was proof of the thorough character of the operations. No chromophil tissue could have remained. From all these observations we are driven to the conclusion that no part of the sympathetic system—superior cervical ganglia, mesenteric nerves, or chromophil tissue—nor the system as a whole is of vital importance for the individual.

You might think that the vegetative system would be important for growth. We have, however, performed unilateral sympathectomy in young kittens and permitted them to grow to adult size. Thereafter we have killed them and compared the weights of various bilaterally symmetrical organs and parts, including bones. There was no demonstrable difference between the two sides. It appears, therefore, that the sympathetic system is not concerned with the growth of the skeleton or of internal organs.

We have made careful observations on the basal metabolism before operation and after removal of each of the three portions—cervical, thoracic, and abdominal—of the sympathetic chains. Usually there is a slight fall of the metabolic rate after sympathectomy. In our experience this has been most persistently observed after excision of the cervical portion. As a rule, however, the operation does not reduce the metabolic rate more than 10 per cent. Indeed, the reduction may be regarded as negligible.

Recent discussion of possible sympathetic control of the tonus of skeletal muscle and of the service of the sympathetic in resisting fatigue raised the question as to the influence of sympathectomy on muscular function and performance. After unilateral sympathectomy the knee-jerks on the two sides were not demonstrably different. Also after unilateral extirpation of the lower abdominal chain in a dog which had been trained to run in a treadmill, there was no reduction in the total performance of the animal, nor was there any notable difference of action of the two hind limbs.

Defects shown by Sympathectomised Animals.

So much for the failure of sympathectomy to produce striking alterations in the body. Now let us turn our attention to the defects shown by animals after the operation.

In a paper published last year we reported that sympathectomy does not prevent the female from performing the functions of reproduction and lactation. The observation on which that report was based was

made on an animal from which the last portion of the sympathetic system was taken only a short time before the birth of her young. This animal did, indeed, nurse one of her two offspring until it was capable of foraging for itself. Later, however, another cat, from which the sympathetic had been removed about twenty months, gave birth to three kittens. The surprising fact appeared that the breasts were not prepared for lactation, and in spite of our efforts the young died from inanition; or from inanition and lack of maternal care, for the mother was utterly indifferent to her offspring. More recent observations have shown that in the dog also a belated effect of sympathectomy is a serious disturbance of the function of the mammary glands.

When animals are totally sympathectomised there is a great reduction of their ability to work. We have completely excluded the sympathetic system from action in a dog which had been trained to run in a treadmill until exhausted. With a standard rate of movement of the treadmill the running lasted approximately two hours, interrupted towards the end by brief periods of rest. After sympathectomy the capacity of the animal to work was reduced about 35 per cent. Of course, the vagus nerves were still intact, and by a reduction of vagal tone the heart could be moderately accelerated. Observations on another animal in which the denervated heart could be only slightly accelerated, and associated therewith there was a great reduction of the animal's ability to run, indicate that much of the retained ability of the sympathectomised animal was due to the cardiac acceleration. Nevertheless the redistribution of blood in the body, the rise of blood pressure, the dilatation of the bronchioles, and the liberation of adrenalin—all possible concomitants of muscular effort and all favourable to prolonged and efficient performance—had been rendered impossible by removal of sympathetic control; and the absence of these important factors must be added to the deficiency of the heart as determining the failure of the sympathectomised animal even to approach his former standard of achievement.

In addition to the lack of adaptative changes in the circulatory system, there is total paralysis of the mechanism for liberating sugar from the liver. This fact was brought out by determining the effect of emotional excitement on blood-sugar before and after sympathectomy. In our experiments excitement, varying between three and ten minutes, caused in normal animals an average increase of blood-sugar of 34 per cent. In sympathectomised animals, on the other hand, a similar duration of excitement resulted in no constant rise of the glycæmic level. As earlier observations had revealed, animals deprived of this regulatory arrangement are extremely sensitive to insulin.

Associated with other evidences of failure of the sympathetic system to operate there is a lack of the normal increase of red blood corpuscles that attends excitement. This absence of polycythæmia is due to non-coöperation of the spleen. All these features—the circulatory deficiencies and the abolition of the mechanisms for liberating blood-sugar and for discharging extra erythrocytes—doubtless work together to bring about the reduced efficacy of the sympathectomised animal when required to make a muscular effort. It must be admitted that many of the details of this picture need to be worked upon further before definite quantitative statements can be made, but its main features are, I believe, as I have stated them.

Not only are sympathectomised animals defective in the performance of muscular work, they are also defective when exposed to cold. The pilomotor muscles are not under control and the hairs are not erected. The smooth muscles of the blood-vessels are likewise no longer under nervous government. Cold has no local contractile effect on either of these structures. For these reasons there is no check on heat loss from the body. Furthermore, the organism has been deprived of the service of an increased secretion of adrenalin to accelerate heat production when the body temperature tends to fall. The sympathectomised animal, therefore, when confronted by the problem of maintaining a normal temperature when it tends to fall, is physiologically inefficient. The behaviour of such an animal in cold weather is in accord with this inefficiency. It exhibits marked antipathy to cold air and to draughts. During the winter it lives almost continuously in the neighbourhood of sources of heat, leaving them only long enough to obtain food.

To test the physiological abilities of sympathectomised animals to control the body temperature we placed them in a cold room, ranging between 0·8° and 6·0° C., and made periodic observations on their rectal temperature and their shivering reactions. In some instances the tests were carried out on the same animals before and after the operation. In the normal state exposure to the cold caused no noteworthy change in the rectal temperature. After sympathectomy there was a rapid drop of the temperature when the animals were placed in the cold room. This was associated with a much greater frequency and prominence of shivering than in normal conditions, and the shivering in turn was associated with a check in the temperature drop. Since shivering was the only resource, except exercise, that was left to protect the animals from a grave hypothermia, the maintained low temperature probably indicates an equilibrium between the heat lost to the cold surroundings and the heat produced by the shivering process.

Sympathectomised animals have difficulty not only when exposed to cold but also when exposed to heat. In order to prove that an animal which takes the upright position may survive sympathectomy, we removed the sympathetic chains from monkeys. For the purpose of giving a group of these animals (among which was one on which we had operated) the benefit of sunlight and fresh air, we placed them in a cage in the yard near the laboratory last July. The normal monkeys were not at all disturbed by the heat. The monkey without the sympathetic chains, however, was found in a short time lying prostrated and gasping; it had a very high temperature and, indeed, succumbed from heat stroke.

In surveying the results of the observations on animals which survive the exclusion of sympathetic nerve impulses you may be more impressed by the slight effects of the operation than by the actual deficiency phenomena. A little thought, however, will show that the slight effects may be misleading. The sympathectomised animals, to be sure, continue to live, but they live within the protective confines of the laboratory, where there are no marked temperature changes throughout the year, no necessity of struggle for food, no requirement of escape from enemies, no danger of hæmorrhage—indeed, where there is a very special and limited sort of existence. Judging by behaviour under such conditions one might reasonably draw the inference that the sympathetic system is of minor importance for the proper functioning of the body. We believe, however, that the inference would be erroneous. If these animals were set free in the outer world and had to meet its requirements of struggle, there would be no delivery of sugar to the blood according to need, no polycythæmia, no splanchnic vaso-constriction with consequent rise of blood pressure and faster blood flow, no great acceleration of the heart, no shifting of the circulation to benefit the contracting muscles, no secretion of adrenalin to hasten coagulation and to abolish the effects of fatigue. The deficiencies of the sympathectomised animal are clearly revealed when it is exposed to cold or heat. If exigencies arise it is unable to preserve the constancy of its internal environment.

Conclusion.

The foregoing survey emphasises a distinction, which has long been recognised, between the "voluntary" and the "involuntary" or "vegetative"

functions of the nervous system. It is desirable to remove from physiology terms having psychological and botanical implications. The nervous system has two relations—toward the *external* and towards the *internal* environment. This fact naturally suggests that a distinction might be based on these oppositely directed functions. The "voluntary" system, which is elaborately provided with exteroceptors and with muscles which operate bony levers, is arranged for altering the external environment or the position of the organism in that environment, by labouring, running, or fighting. These activities may be appropriately regarded as exterofective functions, and the "voluntary" system may therefore be called the *exterofective system*. As we have seen, however, exterofective activities necessarily produce coincident, and possibly highly disturbing changes in the internal environment. Under these circumstances the "involuntary" nervous system plays its part by acting upon the heart, smooth muscles, and glands in such ways as to keep the internal environment constant and fit for continued exterofective action. This interofective action of the "involuntary" or "vegetative" nervous system justifies calling it the *interofective system*. Inactivity of the exterofective system establishes a basal state for the organism because minimal functioning of that system is accompanied by minimal functioning also of the interofective system. Exterofective action is mirrored in interofective action, which rises as the internal disturbance rises and subsides as the disturbance subsides.

The interofective system has just been referred to as if it were single, instead of consisting of the three divisions of which I have already reminded you. If we apply to these three divisions the idea that the function of the interofective system is to preserve *homeostasis*—that is, stability and constancy of the internal economy—we can, without *great* alteration of previous considerations, give a common interpretation to the services of all three divisions. The sacral division, as a group of reflexes for emptying hollow organs, preserves constancy by getting rid of waste and by discharging accumulations which disturb or check the free action of the individual. Incidental thereto the race is assured continuance. The cranial division, as a group of reflexes protective and conservative in function, is more obviously concerned with the preservation of uniformity in the organism; in so far as its main services are involved, those of regulating digestion and absorption of energy-yielding material, it is of fundamental importance for the maintenance of steady states. The sacral and cranial divisions, however, operate only indirectly and somewhat remotely to assure constancy. It is the middle or thoraco-lumbar division of the interofective system which acts promptly and directly to prevent serious changes of the internal environment. By mobilising the bodily reserves and by altering the rate of continuous processes this division operates to keep uniform the fluid matrix of the organism and therefore may properly be regarded as the special and immediate agency of homeostasis.

In offering you this interpretation of the services of the autonomic system I am aware that in many respects it is quite deficient and inadequate. Repeatedly I have had to remark that we need more light before we can see clearly the nature of the functions which are performed by that system. Perhaps, however, the point of view which I have taken may not be the same as yours, and the somewhat different way of regarding familiar facts may lead to new ideas and new researches. If what I have said should have that effect I should be most gratified.

MEDICAL APPOINTMENTS FOR WOMEN. — The Central Public Health Committee of the London County Council has decided that appointments to the hospitals and district medical services which have passed into their control under the Local Government Act shall be open to women as well as to men doctors.

THE CAUSATION OF ECLAMPSIA.

OBSERVATIONS AND EXPERIMENTS.

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ECLAMPSIA is still the "disease of theories," but it is generally attributed, at any rate in this country, to a toxin formed in the placenta. I do not think that this can be the correct explanation.

Eclampsia is, of course, a syndrome rather than a specific disease. It is usually associated with fits, coma, a high blood pressure, and albuminuria, and often with hæmaturia, and is commonly preceded for some days by malaise and albuminuria. But it may prove fatal without any fits being observed, and there may be no coma. I have seen two fatal cases in which the blood pressure was so low that it could not be recorded, and I have also seen one case in which the secretion of urine was free and no albumin could be detected in the urine until after the nineteenth fit, and two cases in which the symptoms came on suddenly in patients under observation in the antenatal ward.[1]

Geographical Incidence of Eclampsia.

The features and circumstances of the disease vary greatly in different parts of the world. Oxley[2] has recently reported that among the last 10,000 consecutive confinements at the East End Maternity Hospital only one woman developed eclampsia.

He states, moreover, that the vast majority of pre-eclamptic patients may be so improved within 24 hours by rest in bed, purgation, and water diet that they are no longer in danger of developing eclampsia. During the last four years, he informs me, only two or three such patients failed to improve, so that induction of labour was imperative. This testimony can be endorsed by all those who have tried this treatment initiated and carried out with such conspicuous success at the Rotunda Hospital.

Cruickshank, Hewitt, and Couper[3] report that 3·6 per cent. of all the admissions to the Glasgow Maternity Hospital are diagnosed as eclampsia. In other words, 360 patients out of the last 10,000 confinements at that hospital have had eclampsia. I am well aware that the institution serves a wide area and that a high percentage of the patients admitted are abnormal; but, nevertheless, the incidence of the disease is extraordinarily high in such places as Glasgow, Dundee, Kirkcaldy, and Kilmarnock. Comment on a ratio of 360 : 1 is clearly superfluous.

It is well known that the incidence of eclampsia in Germany declined very markedly during the war. H. v. Heuss[4] and others have shown that its incidence in that country is closely related to certain meteorological conditions and that it is largely a disease of cities. I have recently pointed out[5] that the incidence of eclampsia and all the toxæmias of pregnancy is extremely low in Siam, and relatively low in Southern China, in most areas of India, in the Persian Gulf, Iraq, Syria, Palestine, and Egypt. It is noteworthy that in the same areas, with their teeming millions, gastric ulcer, diseases of the gall-bladder, carcinoma of the intestines, and appendicitis are also but infrequently encountered.

Theories of Causation.

I submit that these facts by themselves disprove the placental toxin hypothesis. I cannot believe, either, that the Siamese placenta is less toxic than the Scottish placenta or that the anæmic women of Siam are more successful in providing themselves with an

antitoxin than the robust women of Scotland. It is, moreover, impossible to explain how a diffusible toxin formed in the placenta can poison or kill the mother and allow at least half the full-term children of such women to be born alive and thrive.

The only serious attempt to correlate pathological changes in the placenta with the disease has been made by Young,[6] who holds that it is caused by the products of autolysis in a placental infarct which are absorbed only if the main body of the placenta remains attached to the uterine wall. I submit that his hypothesis is untenable for the following reasons:—

1. Infarcts of the placenta are exceedingly common and were found by Siddall and Hartman [7] in 67·7 per cent. of the placentæ they examined from 700 consecutive confinements.
2. The hypothesis cannot explain how patients may recover from ante-partum eclampsia and give birth some weeks later to healthy full-term children; neither can it explain the ætiology of post-partum eclampsia.
3. Placenta prævia is but seldom associated with toxæmic symptoms.
4. Young's experiments offer no conclusive evidence in support of his theory.
5. I shall show that it is disproved by experiments I have carried out.

Young injected products from human placentæ into the subcutaneous tissues of guinea-pigs and so caused convulsions, focal necroses in the liver, and parenchymatous degeneration of the kidneys. He assumed these three effects to be the cardinal criteria of eclampsia. It is, however, well known that eclampsia may occur without convulsions or albuminuria; nor does it always cause specific necroses in the liver. In 1889 Wooldridge[8] reported that he had caused intravascular clotting and hæmorrhagic necroses in the liver by injecting extracts of tissue fibrinogen into dogs. Schmorl[9] repeated his experiments and satisfied himself that this substance when injected into dogs caused not only the typical hæmorrhagic necroses in the liver, but also the changes in the lungs, kidneys, and brain which he associated with eclampsia. In 1929 Dieckmann,[10] apparently unaware of these experiments, injected tissue fibrinogen into dogs and obtained similar results. I have myself injected subcutaneously into a guinea-pig powdered ox lung prepared in the manner described by Dr. Young. The animal died in convulsions after two injections. The liver showed severe degenerative changes and small hæmorrhages, and the kidneys a cloudy swelling of the convoluted tubules.

I have recently had the opportunity of examining sections from the livers of 44 patients who died from eclampsia in different centres in the British Isles. No hæmorrhages were found in 14 out of the 43 cases, and the typical fibrino-hæmorrhagic necroses were present in only 24. Moreover, typical fibrino-hæmorrhagic necroses were found in the liver of a patient who died from post-partum hæmorrhage in whom no evidence of toxæmia was noted during several days in hospital. It is, therefore, clear that the so-called typical hepatic lesions occur in only about 30 per cent. of fatal cases of eclampsia, while they also occur in association with the other toxæmias of pregnancy. The one constant finding in all cases of eclampsia and in all the toxæmias of pregnancy were areas of necrosis in the liver, and I am convinced that the pathological evidence supports the contention that all the toxæmias of pregnancy are caused by the same factors.

I do not propose to enumerate all the hypotheses which have been advanced to explain eclampsia for they are well known, and the voluminous literature has lately been reviewed by Stander.[11]

Albuminuria and Pregnancy.

Before developing my thesis, I should like to make a few observations on the kidneys, the main functions of which are to eliminate endogenous waste products and to assist in maintaining the normal pH of the blood.

Lever,[12] of Guy's Hospital, first pointed out the association of albuminuria with eclampsia in 1843. Because it is so easy to detect albumin in the urine and it is impossible to detect moderate damage of the liver, a great deal of attention has been paid to the kidneys by those investigating the toxæmias of pregnancy. It was even thought that eclampsia was synonymous with uræmia until it was shown that the blood-urea and non-protein nitrogen were not appreciably altered in the former disease.

If it can be proved—and it has been proved—that a patient can have eclampsia without having albuminuria, this evidence is of more value than that of 999 cases in which albuminuria does occur. Such a case offers conclusive evidence that neither albuminuria nor any functional defects of the kidneys are necessary concomitants of eclampsia. On the other hand, albuminuria may be found apart from disease.

Nicholson[13] gave a good account of orthostatic albuminuria in schoolboys, and showed that a high protein diet caused not only albumin but granular casts to appear in the urine of certain boys. Collier[14] and others have described albuminuria following severe exercise.

Fischl[15] reviewed the literature dealing with experimental albuminuria and confirmed the statements that albuminuria could be caused in rabbits and dogs by tying them in various positions or by "palpating" a kidney for a minute. He showed that albumin and casts are passed in the urine of a dog or rabbit if it be tied on a table for 40 minutes with a cushion under its back to cause lordosis. If the animal be repeatedly tied in this position it will develop a fatal hæmorrhagic nephritis. He, moreover, showed that the tendency of such animals to pass albumin and the quantity passed could be influenced by the diet given on the days preceding the experiment.

I have succeeded in causing three out of seven volunteers to pass albumin in their urine by placing them in a modified Walcher's position for 30 to 40 minutes. Two passed urine containing a heavy deposit of albumin and the third a specimen which contained a definite cloud. One volunteer, a healthy athletic medical student, is extremely interesting. After the first experiment his urine contained a very heavy deposit of albumin (alb. ++). On the second occasion his urine, which was clear before the experiment, contained a heavy deposit of albumin after he had been in Walcher's position for 10 minutes. The urine again became clear within an hour of the experiment. His urine contains a cloud of urine after tennis or any sustained exercise, but otherwise it has always been clear on the many occasions on which it has been tested. I am convinced that he would suffer from a severe albuminuria were he but to become pregnant. All the specimens were centrifuged and examined microscopically, but neither casts nor abnormal cells were found on any occasion.

It is therefore certain that the position of lordosis maintained for 30 to 40 minutes can cause a healthy man or woman (two of the volunteers were women) to pass albumin in the urine, which disappears shortly after the experiment. The albuminuria is probably caused by traction on the left and possibly on both renal veins, and it is possible that the length of the veins may be one of the factors which decides the amount of lordosis necessary for its production. I have recently shown[16] that rapidly growing benign ovarian tumours may cause albumin and casts to appear in the urine which disappear when the cysts are removed.

Dr. F. R. Winton authorises me to say that he intends to publish in a few weeks the results of some experiments he has been carrying out at University College which show that a reversible albuminuria may be caused by increasing the pressure in the renal vein of an isolated dog's kidney. Albuminuria cannot, however, be caused by increasing the pressure in the renal artery.

Taking these facts together, there is every reason to believe that albuminuria may be caused in a pregnant woman by pressure or traction on the renal vein especially during the latter weeks of pregnancy, when the tumour is big and the woman stands and

walks with her spine in the position of lordosis. It is also reasonable to assume that the albuminuria so often associated with labour may be due to the increased pressure in the renal veins associated with the pains. In any case, it is certain that the amount of albumin in the urine bears but little relation to the extent of the lesions in the kidneys. It is, however, probable that long-continued traction on the renal veins may cause damage to the kidneys. I suggest that pregnant women with albuminuria should lie flat on their faces on a wooden bed in which a hole is cut through which the abdomen may protrude and be supported with suitable straps.

Nephritis and Eclampsia.

The kidneys of women dying from eclampsia show a cloudy swelling, especially affecting the convoluted tubules, and in only a small percentage of cases is there any evidence of nephritis. The lesions in many cases are very slight. It is, therefore, abundantly clear that the kidneys are not concerned in the ætiology of eclampsia and that the lesions found in them are caused either by the toxin which caused the toxæmia or by mechanical factors—or possibly by a combination of both factors. It is, however, more than probable that a nephrosis, however caused, may sometimes develop into a nephritis.

Where pregnancy is associated with nephritis the history, response to treatment, and chemical findings are completely different from those of eclampsia.

A woman is known to suffer from nephritis. She becomes pregnant. The symptoms of the nephritis become more marked, and there is often a miscarriage or premature labour. It may be necessary to perform induction of labour in order to save the woman's life. The nephritis gradually improves after the pregnancy is terminated. She again becomes pregnant, and may first be seen by the physician when she is suffering from a fatal uræmia. Severe symptoms appear earlier with each succeeding pregnancy. She does not have eclampsia but uræmia—and that frequently before the twenty-eighth week of her pregnancy.

It is almost true to say that a woman with obvious nephritis never develops eclampsia. There is no reason, however, why a patient with a mild degree of chronic nephritis should not have eclampsia, and it is possible that the liver may be indirectly embarrassed by such a condition.

Source of Toxins in Eclampsia.

If eclampsia be caused by a toxin and that toxin does not originate either in the fœtus or in the placenta—then it must be absorbed from the bowel. We must therefore explain why the disease should only occur in association with pregnancy.

Pregnancy affects the woman in the following ways:—

1. It causes metabolic changes, the most important of which are: (*a*) The blood volume is increased while its specific gravity is lowered. (*b*) There is a marked increase of fat, lecithin, cholesterol, and fibrinogen in the blood. (*c*) The blood calcium is lowered. (*d*) The proportion of urea nitrogen to non-protein nitrogen in the blood is lowered. (*e*) The alveolar CO_2 tension is lowered and the CO_2 combining power of the blood is decreased. (*f*) The basal metabolic rate is increased. (*g*) The cardiac output is increased. (*h*) The amount of glycogen in the liver and muscles is very much decreased at the end of pregnancy (in dogs).[17] (*i*) The partition of nitrogen in the urine is altered. (*j*) A marked storage of nitrogen occurs in the body.

2. The bulk of the uterus embarrasses the intestines and may cause albuminuria.

3. The mother has to undertake some of the metabolic functions of, and get rid of the waste products of metabolism for the child.

4. The growing fœtus deprives the mother of considerable quantities of such important substances as calcium, iron, iodine, and sugar, and in increasing amounts. The fœtus increases its weight by nearly a third during the last four weeks of gestation, and probably uses in that time about 8 g. of calcium. The total amount of calcium in the maternal blood is about 0·5 g.

I suggest that the causation of eclampsia depends on two main factors—namely, the absorption of toxins from the bowel and a breakdown of the normal defensive mechanism.

Dietetic Deficiency and Pregnancy.

Absorption of toxins from the bowel will depend upon the food ingested and the time its residue remains in the intestines.

In spite of amazing discoveries on the effects of diet—stimulated by the discoveries of Hopkins less than three decades ago—but few physicians realise the significance of dietetics or the vast possibilities it offers in preventive and curative medicine. Deficiency of one or more vitamins in the diet is recognised to be the cause of pellagra, beri-beri, scurvy, Barlow's disease, Pink's disease, rickets, osteomalacia, keratomalacia, xerophthalmia, dental caries, and vesical calculus. Other diseases and morbid conditions, such as pernicious anæmia, sprue, rheumatism, atheroma, cyclical vomiting, gout, urticaria, and certain mental conditions are probably caused by or related to imperfect diets. Constipation—the thief of health, the ally of sepsis, the handmaid of toxæmias, the friend of insomnia, and the builder of piles—is in the vast majority of cases the penalty of an incorrect diet. If infants be included in our review there can be but little doubt that a very high percentage of the ill-health and disease in the world is directly or indirectly attributable to faulty diets.

Most animals, including man, can adapt themselves for long periods of time to incomplete diets, and that is one of the main reasons why their importance is so little appreciated. Moreover, the troubles caused by food deficiencies may take a long time to develop, so that it is difficult to relate cause and effect. The strain of pregnancy often lays bare such deficiencies, and that is why beri-beri is so often associated with pregnancy and osteomalacia, but rarely causes symptoms apart from it. It is possible that the severe neuritis which is sometimes associated with pregnancy in this country may be a form of beri-beri. A certain type of pernicious anæmia is peculiar to pregnancy and is associated with a high mortality. This disease is very prevalent in the Bombay Presidency. It may be invariably "cured"—providing the woman is not seen for the first time when moribund and in labour—by the exhibition of liver extract, and it is, therefore, almost certainly another example of a deficiency disease made evident by pregnancy.

Assimilation During Pregnancy.

It is obvious that a diet has not only to be complete but has to be assimilated. A woman when pregnant needs to provide herself with more calcium, iron, and iodine, and probably a greater amount of vitamins than an ordinary person.

The assimilation of her food may be interfered with by several factors, two of the most important of which are anxiety and the bulk of the uterus.

The influence of the nervous system on digestion has long been known to physiologists, but the implications of these facts have not been adequately realised by the clinician. During the war several observers found that men, afraid of being conscripted, developed a dilatation of the stomach associated with marked disorders of the digestion and with insomnia. The dilatation of the stomach disappeared as the probability of war service receded. Business worries, financial and family anxieties, over-study, nervous exhaustion, however produced, cancerophobia and other fears may, and often do, destroy the appetite, upset the digestion, and disturb the metabolism of the body.

Marriage calls for great adjustment in a woman's mental and physical life, and she often suffers at the very beginning of her married life from mental traumata which produce important, varied, and often ill-recognised sequelæ. Moreover, the fear of pregnancy and what it means, followed by the very natural dread of labour, add to her worries. If at this time she

lacks sympathy and understanding, these and other psychic traumata may upset the digestion and the metabolism of the body. It is evident that unmarried primiparæ are more likely to suffer from these anxieties than those who are married, and this fact alone might account for the higher incidence of the toxæmias which is said to occur in such women.

The bulk of the pregnant uterus undoubtedly tends to cause intestinal stasis, and thus not only prevents food from being assimilated, but causes an increased absorption of toxins. Mills[18] has shown that the complex protein tissue fibrinogen may be absorbed through the intact mucous membrane and be excreted unaltered through the kidneys of dogs and rabbits. It is, therefore, clear that it is not always necessary for proteins to be split into amino-acids before they are absorbed, and it is conceivable that a mucosa damaged by prolonged coprastasis might allow proteins to pass unaltered into the blood stream. Such proteins might be extremely toxic to the body. I have described [16] the serious effects that may be caused by rapidly growing ovarian tumours, and there is no reason why the pregnant uterus should not cause similar symptoms.

Before concluding these remarks on diet I should like to refer to the significance of sunlight. Maxwell[19] has conclusively proved that osteomalacia is caused by a deficiency of vitamin D in the diet, but I think that it is clear that deficiency of sunlight is the ætiological factor of most importance in causing the condition. It is also clear that the sun's rays save the vast majority of people in the East from one or other of the deficiency diseases which would otherwise inevitably result from their diet.

Sunlight, absence of worry, and a diet having a low protein content go hand in hand with a low incidence, both of the toxæmias of pregnancy and diseases of the intestinal canal.

It is well that "bottled sunlight" is available for the peoples of these islands, and it is to be hoped that one or other of the many excellent preparations now on the market will be more frequently prescribed for pregnant women; for it is important to remember that not only may certain diseases and complications of pregnancy be caused by an incomplete diet, but that the health and welfare of the unborn child is affected, probably more than is realised, by the food its mother takes.

Toxæmia and the Protective Action of Calcium.

Having briefly considered the subject of diet and the embarrassment caused to the intestines by the bulk of the pregnant uterus, we are now in a position to study the effects of intestinal stasis and note how the defensive forces of the body are upset by pregnancy.

The lower part of the small intestine and the colon are inhabited by countless billions of bacteria. These bacteria have the important function of causing fermentation and decomposition of those foodstuffs which resist the action of the digestive juices in the higher bowel, and thus allow certain products, otherwise lost, to be absorbed by the body. This decomposition, should it proceed too far, ends in putrefaction and the formation of such toxic substances as acetic and lactic acids, and the aromatic compounds indol, skatol, cresol, and phenol. Added to these toxic substances are the endotoxins, liberated by the dead bacteria. It has been estimated that an adult person passes some 480,000,000,000 bacteria in a normal stool, so that it may be assumed that the amount of these endotoxins absorbed is in some circumstances far from inconsiderable.

Indol and skatol are oxidised to form indoxyl and skatoxyl and are then conjugated in the liver capillaries with potassium sulphate to form potassium indoxyl and skatoxyl sulphate. It is believed that the other toxins are in some manner not yet understood rendered harmless to the body in the liver. I propose to offer evidence that calcium is the most important substance concerned in protecting the body against these and other toxins, although I do not wish to minimise the importance of the vitamins or the significance of such substances as iron or iodine.

Calcium is by far the most abundant metallic element in the body and is found in all of its cells and fluids. It is present in animal and vegetable foods partly in loose combination with albumins of an acid character, but to a much greater extent in the salts of phosphoric and carbonic acids. It is mainly excreted through the bowel, but the proportion excreted through the kidneys is raised if the urine be markedly acid. There are usually about 10·2 mg. of calcium in 100 c.cm. of blood-serum. Calcium is controlled in the body by the parathyroids but can only be properly utilised if a sufficient supply of vitamin D be assured.

King and Stewart[20] showed in 1909 that the bile-pigments and not the bile-salts caused the toxic symptoms of obstructive jaundice, and that calcium combined with these pigments and rendered them non-toxic. This work was confirmed by King, Bigelow, and Pearce[21] in 1911. They found that calcium protects the organism against the toxicity of bile-pigments, but at the same time depletes the reserve of calcium in the tissues and causes its increased elimination. There may be an actual increase in the total calcium present in the blood, but much of it is combined with bilirubin so that the result is a decreased concentration of ionised calcium.

P. D. Lamson has for some years been directing research on the toxicity of carbon tetrachloride. He and his associates while working at Johns Hopkins University found it impossible to produce visible signs of intoxication in dogs by the oral administration of carbon tetrachloride, even when given in doses up to the capacity of the stomach (250 c.cm.). The usual dose given to an adult is 3 c.cm. In 1925 the work was transferred to the Vanderbilt University Medical School, and Minot[22] states that "in striking contrast to the results obtained at Johns Hopkins University the dogs at Vanderbilt University died after a dose of 4 c.cm. of carbon tetrachloride per kilo of body-weight." These dogs lost their appetite and either became unconscious or developed muscle twitchings which ultimately involved the entire musculature in typical tetany. Death always occurred between 40 and 60 hours after the drug was administered.

On investigation it was discovered that the dogs at Nashville were fed on a lean meat diet and allowed but little bone. It was found that the simple addition of calcium salts to the meat diet for two weeks before the administration of carbon tetrachloride made the dogs at Nashville show the same tolerance for the drug as those at Baltimore. Furthermore, it was found that if calcium chloride were administered intravenously to dogs in the convulsive or unconscious stages of intoxication they were able to walk round the laboratory in a fairly normal condition 15 to 30 minutes after the injection. But although these dogs were saved and appeared to return to normal health their livers subsequently revealed severe lesions. The oral administration to dogs of carbon tetrachloride in doses of 2 c.cm. per kg., always caused lesions of the liver and kidneys but no demonstrable functional disturbances as estimated by the phenol-tetrachlorphthalein, and phenol-sulphonephthalein tests.[23] The poison caused different lesions in the body according to its route of entry.[24]

I will show that sodium and potassium oxalate given in sufficient dosage not only cause nephritis, but severe necrosis of the liver, the lesions being comparable to those seen in some cases of eclampsia. Dogs in convulsions and dying from these poisons may be saved by the intravenous injection of calcium chloride. I will also show that guanidine carbonate is much more toxic to dogs if their blood calcium be previously lowered by an intravenous injection of sodium oxalate. From this evidence it is clear that calcium defends the body against the toxic effects of bile-pigments, carbon tetrachloride, sodium oxalate, and guanidine carbonate. It is peculiarly interesting to note that dogs can draw on their store of calcium in their bodies to defend themselves against the toxic bile-pigments, but that the mobilisation of the calcium is not rapid enough to defend them against carbon tetrachloride. In both sets of dogs the blood calcium was normal or above normal levels, so that it is evident that estimations of the blood calcium by any known means are valueless in these cases. Calcium in the blood is locked up or bound in many ways. It is only the free or ionised calcium that is of service in defending the body against toxic substances, and

biochemists will render a great service to medicine if they can devise means of measuring such calcium in the blood.

If the liver function be upset by any toxin the proper metabolism of meat is prevented and an increase of guanidine appears in the blood. Guanidine, like insulin, lowers the blood-sugar and is antagonistic to calcium. A vicious circle is thus initiated; the calcium, which is insufficient to deal with intestinal toxins, is opposed by increasing quantities of guanidine which lowers the blood-sugar. The glycogen stores of the body are seriously depleted at the end of pregnancy, and the great demands for sugar on the part of the fœtus must be met from "current" supplies and not from reserves.

The Genesis of Eclampsia.

I will now describe how I believe an attack of eclampsia to be initiated. For reasons I have already stated the pregnant woman absorbs more toxins than normal from the intestinal canal. These toxins should be detoxicated and conjugated in the liver, calcium being the most important chemical in the processes involved. The liver possibly carries on its functions with low reserve powers for several weeks; but the calcium intake is insufficient. The fœtus, a true parasite, demands considerable and increasing supplies of those very substances—calcium, sugar, iodine, and iron—which the mother needs to save herself from impending disaster; and the mother, obeying biological laws, meets the demands. The liver, carrying out metabolic functions for both mother and fœtus and overwhelmed by an excess of toxins, fails, and the stage is set for a catastrophe which may be precipitated by the ingestion of food, by the onset of labour, by some violent emotion, or by a sudden change in the meteorological conditions.

The fits are probably caused by a sudden drop in the level of the blood-sugar associated with a hypocalcæmia, or by hæmorrhages into, or œdema of, the brain. Minot and Cutler[25] state that the blood-sugar is lowered by carbon tetrachloride. It may be raised either by giving calcium or sugar. If sugar alone be given the nervous symptoms persist, but if calcium alone be given the blood-sugar is raised and the nervous symptoms disappear. They[26] state that the blood-sugar is low both in eclampsia and in pre-eclampsia and that in eclampsia the blood guanidine is definitely raised. Mann and Magarth[27] showed in 1921 that removal of the liver in dogs produces a condition which closely resembles eclampsia. It has also been shown that increasing doses of insulin given to dogs on a well-balanced diet cause similar symptoms leading to death, with changes in the liver comparable to those seen in those of patients who die from the toxæmias of pregnancy.[28]

The results of investigation into the blood-sugar levels in eclampsia are conflicting. A few workers report a definite hypoglycæmia, but the majority are unable to obtain results which do not fall within normal limits. The time at which the blood is taken for analysis is of paramount importance. There is evidence[29] to suggest that a sudden fall in the level of the blood-sugar occurs immediately before the fit, and that it may be higher than normal during and immediately after the convulsion. That is to say, a patient suffering from hypoglycæmic convulsions may actually have a higher blood-sugar than a man in possession of normal health. Similarly, a sudden drop in the blood calcium causes tetany, and I am informed that it has occurred with a blood calcium of 14 mg. per cent.[30]

In eclampsia the damaged liver will be unable to elaborate antithrombin, and the unopposed fibrinogen in the blood, already greatly in excess of normal, might cause intravascular clotting as described by Wooldridge and hæmorrhages in the liver, brain, and lungs.

A primipara would be more liable to the condition for the three following reasons: (1) Her abdominal musculature is more taut and causes greater embarrassment to the intestines. (2) The head of the fœtus usually fixes in the pelvic brim four weeks before the onset of labour and increases the tendency to intestinal stasis. (3) She fears labour and her anxieties are usually increased by her friends.

Hydramnios and multiple pregnancy obviously cause increased embarrassment of the intestines, and the latter condition causes an increased drain on the maternal supplies. The association of the disease with certain weather conditions may be explained by the fact that the sudden onset of cold weather demands an immediate rise in the blood-sugar which the woman might not be able to meet. It has been shown by Embden, Lüthje, and Liefmann[31] that metabolic rates are normally increased in cold weather and decreased in warm weather.

There is no known fact about eclampsia that cannot be explained on the hypothesis that it results from increased absorption of toxins and a breakdown in the mechanism which normally defends the body against them. There is no hard-and-fast line, clinical or pathological, to demarcate eclampsia from any other of the toxæmias occurring during the latter months of pregnancy, and the evidence suggests that they are all caused by the same factors, and are different expressions of a damaged liver.

Accidental Hæmorrhage.

Cases of accidental hæmorrhage may be divided into two groups. The larger group consists of those in which the placenta has a lower insertion than normal, but too high to be termed placenta prævia. Such cases are not usually associated with albuminuria. The other group of cases is associated with a true toxæmia. Failure to recognise these distinct groups has caused much confusion and has tended to obscure the ætiology of the toxæmic group.

Browne,[32] as the result of some interesting experiments with rabbits, has suggested that chronic nephritis is a predisposing factor in the causation of this condition. I submit that his conclusions are untenable for the following reasons:—

1. Toxæmic accidental hæmorrhage does not occur in Siam, the Persian Gulf, Iraq, Syria, although chronic nephritis is not uncommon in these countries.
2. A high percentage of cases offer no evidence of chronic nephritis when examined a fortnight after delivery.
3. Of the nine fatal cases whose kidneys I have examined not one showed evidence of a chronic nephritis.
4. I obtained sections of the liver from seven of these nine cases. They all showed areas of necrosis, and in three hæmorrhagic necroses were present.

It seems clear that toxæmic accidental hæmorrhage, like eclampsia, is associated with areas of necrosis in the liver, and its ætiology can be explained in a similar manner.

Experimental Work on the Nature of Eclampsia.†

I will now give a résumé of the experimental work I have done during the last three years at Bangkok. Dogs were used because their metabolism is similar to that of man and they have placentæ which are partly deciduous.

They were kept in suitable cages in the open air under thatched roofs, and were exercised morning and evening. The urine was examined daily for albumin and at frequent intervals for casts and cells. Most domestic animals in Siam are fed on boiled rice with a few boiled vegetables, and this was the diet given to the dogs until they were given the all-meat diet mentioned in the experiments. The meat given was beef muscle and contained but little fat. No bones were allowed. Such a diet contains all the vitamins.

It must be remembered that the duration of pregnancy in dogs is 63 days compared with 265 days in man. It is always difficult to procure pregnant bitches, and such animals when obtained are usually within three weeks of

† The expenses were met from a grant given by the Rockefeller Foundation for the use of the visiting professors at Bangkok, to whom I have pleasure in expressing my gratitude. I also wish to thank my past assistants, Dr. Chamras and Dr. Piam, for looking after the dogs and assisting me with the operations, and my friend, Dr. Wilfred Shaw, for allowing me the hospitality of his laboratory at St. Bartholomew's Hospital since my return to England and for taking the microphotographs.

term. It is thus obvious that errors in diet have much more time to produce their effects in man than they have in dogs.

The experiments fall into four main divisions: 1. The injection of substances intravenously. 2. The operative separation of the placenta, and the injection of substances into the uterine vessels to cause local thrombosis. 3. The causing of an intestinal obstruction, usually by closing the anus. 4. The feeding of pregnant and non-pregnant dogs on a meat and water diet.

Intravenous Injections.

1. *Solution of fæces.*—Fæces from a pregnant bitch were placed in a tin and covered with water in which they were stirred. The tin was allowed to stay in the sun for three days. The fluid was then boiled and filtered. On Dec. 5th, 1927, 10 c.cm. of this solution together with 10 c.cm. of a 2 per cent. solution of sodium oxalate were injected into a vein of a large black bitch near term. Three pups were born within 24 hours of the injection. Two were stillborn and the third died the next day. The bitch had albumin + in her urine for two days, and a trace of albumin for a further six days.

2. *Eclamptic blood.*—On August 20th, 1928, 5 c.cm. of citrated blood from an eclamptic patient were injected intravenously into a small pregnant bitch. Next day 15 c.cm. of blood from the same patient (it had been kept in an ice-chest) were injected intravenously into the same bitch. Some of this blood missed the vein. The day following the bitch had albumin + in her urine. A trace of albumin was found on the 23rd, but none was subsequently discovered. The bitch remained well and was used for further experiments.

On Feb. 11th, 1929, 40 c.cm. of citrated blood from an eclamptic patient were injected intravenously into a pregnant bitch which had been for five days on a meat diet. The injection apparently had no effect on the animal, and albumin never appeared in the urine. She did, however, die on the 14th evening of the meat diet.

It is evident that relatively large doses of eclamptic blood are not very toxic to pregnant bitches.

3. *Potassium and sodium oxalate.*—(*a*) Bitch near term; 45 c.cm. of a 4 per cent. solution of potassium oxalate were injected intravenously in three doses of 10, 15, and 20 c.cm. between Jan. 7th and 10th, 1929. The anus was closed on the 9th and the bitch was put on a meat diet. On Jan. 11th the animal refused food; on the 12th it reeled around as if drunk, and on the 13th it went into convulsions. The back was extended, the eyes remained open, and there was a marked tremor of the limbs. The bitch died after the convulsions had lasted one hour and before the pups were born.

Non-pregnant bitch.—(*b*) 80 c.cm. of a 2 per cent. solution of sodium oxalate were injected intravenously in three doses of 20, 20, and 40 c.cm. between Jan. 16th and 19th, 1929. One hour after the last injection convulsions commenced. The dog crunched its teeth, bit its tongue, and died half an hour later.

A third dog developed convulsions after three doses of sodium oxalate but was saved by two injections of calcium chloride.

The livers of both the dogs who died showed severe degeneration with areas of necrosis. Many of the capillaries and veins were blocked by hyaline thrombi. The kidneys showed a severe parenchymatous degeneration. The convulsions were very similar to those seen in eclampsia, and it is noteworthy that animals with areas of necrosis in the liver and severe parenchymatous degeneration of the kidneys may be saved by the intravenous injection of calcium chloride.

4. *Guanidine carbonate.*—With the object of lowering the blood calcium two dogs—a bitch of 11·5 kg. and a dog of 12·3 kg.—were given three intravenous injections of 10 c.cm. of a 2 per cent. solution of sodium oxalate on June 29th, July 1st, and July 3rd. On July 7th 1·0 g. guanidine carbonate in 5 c.cm. of normal saline was injected intravenously. The symptoms in the two dogs were very similar: (1) The blood pressure rose by 40 mm. Hg within five minutes. The highest reading obtained was 170 mm. (60 mm. above the original reading). (2) A definite weakness of the legs, especially the hind legs, was apparent after a few minutes. (3) The dog stood or sat with half closed eyes and bowed head and sneezed frequently, knocking its head on the floor. I have seen the same symptoms in severe cases of distemper. (4) The dog vomited and passed frequent soft light-coloured stools. (5) Excessive salivation was very pronounced. (6) The pulse became very irregular, with frequent extrasystoles. In one dog a definite coupling of the beats persisted for over an hour. (7) The blood pressure remained elevated for over six hours.

At 10 A.M. on July 8th a bitch of 10 kg., with a blood pressure of 110 mm. Hg, was given 20 c.cm. of a 2 per cent. solution of sodium oxalate intravenously. At 2·30 P.M. 1·0 g. guanidine carbonate in 5 c.cm. of saline was injected intravenously. The symptoms observed were similar to those already described. In this case, however, the dog vomited more frequently and the respiration-rate was amazingly affected. Half an hour after the injection the respiration-rate was 204. Later the following readings were made: 3.15 P.M.: blood pressure, 190; pulse, 126; resp., 188 4.30 P.M.: B.P., 155; pulse, 103; resp., 36. The dog appeared to be quite well five hours after the injection.

Three dogs which had been fed on meat and water for four weeks were then used. On August 5th 1·0 g. guanidine carbonate in 5 c.cm. of saline was injected intravenously into all three dogs and did not appear to have any effect on the animals. It was thought that the drug which had been kept in solution in ampoules might have deteriorated. On the 8th 1·0 g. guanidine carbonate in a freshly prepared solution was injected intravenously into two of the dogs used on August 5th. One dog had mild symptoms with marked coupling of the pulse beats, but became quite normal in three and a half hours. The other dog had mild symptoms, but the blood pressure remained elevated for seven hours.

It is thus evident that the same dose of guanidine is made much more toxic to dogs if the blood calcium be previously lowered by an injection of sodium oxalate. It is possible that the continuous presence of an increased amount of guanidine in the blood might prove to be more serious than the sudden introduction of a large dose of the drug, for guanidine is antagonistic to calcium which obviously protects the body from its toxic effects.

The effect of separating the placenta was tested as follows:—

Separation of the Placenta.

On Dec. 14th, 1927, a bitch was anæsthetised with ether and the abdomen was opened. A small incision was made through the wall of the uterus superficial to a placenta. The placenta was then separated from the uterine wall with the little finger for an inch in all directions. The incision in the uterus was sutured with catgut and the abdomen was closed. The urine remained normal, and the dog took its food well and enjoyed excellent health.

An effort was then made to produce thrombosis in the vessels supplying the placenta by injecting drugs into the uterine vessels.

On Dec. 17th, 1927, I opened the abdomen of a medium-sized bitch and selected a large vein immediately superficial to a placenta. Into this vein 6 c.cm. of a 25 per cent. solution of sodium chloride were injected and the vein was then tied. Albumin + was detected in the urine for three days after the operation.

After this date the use of ether was discontinued and all operations were performed under morphine narcosis, morphine sulphate gr. $\frac{1}{4}$ being injected half an hour before the operation commenced.

On Feb. 1st the abdomen of a large bitch was opened and 10 c.cm. of a 25 per cent. solution of sodium chloride were injected into the right uterine artery. The urine next day contained albumin + +; and two days later it contained 12·0 g. of albumin per litre. The albumin became less and less and finally disappeared 12 days after the operation. No pups were born.

On Feb. 16th the abdomen of a medium-sized bitch was opened and 10 c.cm. of a 25 per cent. solution of sodium chloride were injected into the right uterine artery. A trace of albumin was detected in the urine only on the day following the operation. On the 24th the wound was opened and two veins immediately superficial to a placenta in the left cornu were selected. Into one of these 10 c.cm. and into the other 8 c.cm. of a 25 per cent. solution of sodium chloride were injected. The veins were then tied. The faintest trace of albumin was detected in the urine on the two days following the operation. On March 8th the wound was reopened and an incision was made in the wall of the uterus in the immediate neighbourhood of the veins into which the injections had been made. The placenta was then separated for about a third of its area of attachment and the incision closed. Some old blood, probably the result of the injections, escaped during this manœuvre. 10 c.cm.

of a 25 per cent. solution of sodium chloride were then injected between the placenta and the uterine wall. On the following day one dead pup was born in an excess of old blood. The urine contained a trace of albumin. Next day the urine contained no albumin. The other pups were not born.

On March 29th the abdomen of a medium-sized bitch was opened and 3 c.cm. of a 25 per cent. solution of sodium salicylate were injected into the right uterine artery. 2 c.cm. of the same solution were injected into the right uterine vein. Both vessels were tied. The urine contained no albumin. On April 3rd the wound burst open and the dog died. The pup in the right cornu was macerated. Many of the vessels in both horns of the uterus were thrombosed and were stiff like pipe-stems. All the placentæ were still attached to the uterine walls.

It is thus evident that neither separation of a small area of the placenta nor thrombosis of vessels in the uterus causes a toxæmia.

Intestinal Obstruction.

Several methods were tried to obtain a chronic intestinal obstruction in pregnant bitches. The method adopted was to close the anus in the following manner.

Two purse-string sutures of silk or chromicised catgut were passed through the anal mucous membrane about a quarter of an inch distal from the anus. These ligatures when tied closed the anal canal. The anus was then closed with silkworm gut. These ligatures were covered with adhesive plaster passed under the tail and round the body.

Six dogs were treated in this manner; they were given the ordinary rice diet, to which some meat was added. The sutures tended to cut out after about three days and further sutures had to be introduced.

Dog 1.—Experiment lasted five days. A faint trace of albumin was found in the urine before the dog was killed.

Dog 2.—Bitch was not pregnant. Experiment lasted 11 days. A trace of albumin was found in the urine before the dog was killed.

Dog 3.—Experiment lasted 10 days. Red blood corpuscles, pus cells, and epithelial cells were found in the urine.

Dog 4.—Experiment lasted 12 days. Red blood corpuscles, epithelial cells, and a trace of albumin were found in the urine before the dog was killed.

Dog 8.—Experiment lasted 11 days. On the sixth day the abdomen was opened and two small pieces of liver were excised. The urine towards the end of the experiment contained albumin ++, and the uterus was found at the post-mortem examination to be septic.

Dog 7.—The dog died within 24 hours of the anus being closed. At the post-mortem examination it was found that all the placentæ had been separated before death. As the uterus was incised a lot of old blood escaped. The urine contained albumin and pus cells. The dog was mangy. This was the only case of antepartum separation of the placentæ.

Dog 5.—Medium-sized bitch. The abdomen was opened and the neck of the uterus, including the vessels on either side, together with the rectum were included in two strong chromicised catgut sutures. The dog had convulsions and died 41 hours after the operation.

Dog 6.—A large black bitch, not pregnant. The abdomen was opened and the rectum was occluded as low down as possible with two chromicised catgut ligatures. After six days the dog vomited and was unable to take any food, so it was killed with an injection of sodium cyanide. The urine contained many red blood corpuscles and epithelial cells.

The pathological findings in all these animals were remarkably similar. The kidneys showed a parenchymatous degeneration, especially affecting the convoluted tubules. The *liver* showed marked degenerative changes. The cells with their nuclei stained badly: many showed marked vacuolation. Small areas of necrosis were seen, but had no relation to any part of the lobule. Small collections of leucocytes were occasionally seen. Large numbers of leucocytes surrounded the portal vessels. Areas of hæmorrhage were seen in sections from dogs 2, 4, and 7.

In the intestines small hyperæmic areas were visible in many areas of the small intestine, the jejunum being especially affected. On microscopic examination these areas showed villi without any epithelium. Many of the villi were completely destroyed (Fig. 1).

These experiments produced very grave lesions in the liver and kidneys, but were open to the accusation that the results were due to sepsis rather than to an intestinal stasis.

Feeding Experiments.

Three dogs were then kept in cages and fed on fresh lean meat and water. They all became extremely constipated.

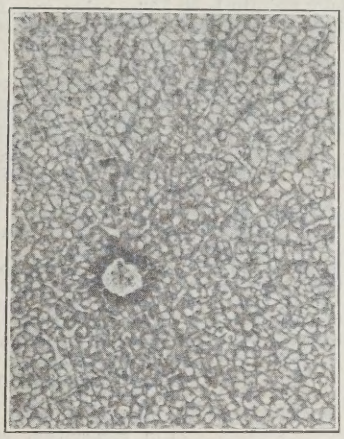
Dog 11.—A large pregnant bitch, and dog 12, a large bitch, not pregnant, were killed on the twelfth day of the experiment. Six pups were born to dog 11 on the seventh day of the experiment one being stillborn. Dog 13, a medium-sized pregnant bitch, died on the fourteenth day of the experiment. It is possible that the blood from an eclamptic patient injected on the sixth day of the experiment had some effect on this animal.

The urine of all the animals contained red blood corpuscles, pus, and epithelial cells before they died. The urine of dog 12 contained a slight trace of albumin. All the *kidneys* showed parenchymatous degeneration, especially affecting the convoluted tubules (Fig. 2). The changes were most marked in dog 13. The *livers* of dogs 11 and 12 contained an excess of fat and showed small areas of cellular necrosis. The liver of dog 13 showed severe degeneration and areas of

FIG. 1.

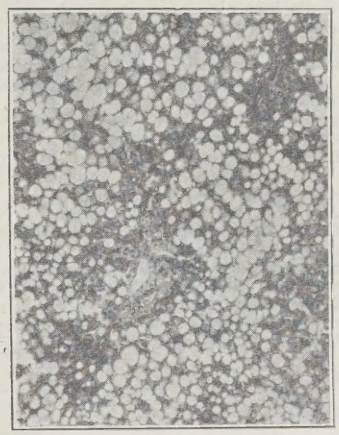
(Dog 10.) Section showing villi of jejunum which have lost their epithelial covering.

FIG. 2.



(Dog 11.) Section of liver showing fatty degeneration and œdema.

FIG. 3.



(Dog 30.) Section of liver showing fatty degeneration and loss of liver structure.

cellular necrosis. Many hyaline thrombi were seen in the sections from all these dogs. Sections taken through the hyperæmic patches scattered through the small *intestines* and particularly in the jejunum, showed villi without their epithelial covering and in all stages of degeneration.

Two large bitches which had been frequently served between Feb. 10th and 15th, 1929, were placed in cages on Feb. 15th. They were both killed after they had been on a meat and water diet for 33 days.

Dog 30 was thought to be pregnant, for the abdomen became definitely enlarged. After about four weeks the abdomen became smaller, and towards the end of the experiment the dog became weak and ill although it was taking about one and a half pounds of meat daily. The dog was killed with ether on March 19th. The colon was very distended for its entire length with enormously hard black fæces. The small intestines were practically empty. There were small hyperæmic patches in the intestines, especially in the jejunum. The *uterus* was enlarged and showed definite signs of a recent pregnancy. There were five distinct placental sites and a lot of sticky fluid in both horns. No pups were born. They must have died and been partly absorbed and partly discharged per vaginam. The urine remained normal. On microscopical examination of the *liver* the whole section stained badly. One portion of the section shows extreme fatty degeneration, looking like omentum. There are areas of cellular necrosis with loss of liver structure (Fig. 3). One large vein and many smaller vessels are occluded by hyaline thrombi. The *kidneys* showed parenchymatous degeneration especially affecting the convoluted tubules.

Dog 31 was never thought to be pregnant. On the 19th it was killed with chloroform. The post-mortem findings were similar to those seen in dog 30. The urine contained a trace of albumin and a few hyaline casts. The *uterus* was enlarged. Two placental sites were seen in the left cornu and one in the right. In the tip of the right cornu was a small fœtus, the placenta of which was partly detached. There was some old blood in the sac and behind

FIG. 4.

(Dog 35.) Section of liver. The liver cells are merely indicated in order to show up the hæmorrhage in the periphery of a lobule. Hæm. = areas of hæmorrhage. L.C. = liver cells. Th.V. = thrombosis of vein. Leuc. = collection of leucocytes.

the partially detached placenta. On microscopical examination of the *liver* the cells appeared to have undergone a granular degeneration, but there seemed to be no great excess of fat in the sections. There was a fair amount of congestion with early hæmorrhages in one or two areas, and there were small areas of cellular necrosis.

One dog and two non-pregnant bitches (32–34) were confined in cages and placed on the meat diet. They were killed at the end of four weeks. The findings were similar to those of dogs 30 and 31. The kidneys showed parenchymatous degeneration. The liver showed marked fatty degeneration with many areas of cellular necrosis scattered through the sections, and affecting all portions of the lobules.

Dog 35 was a medium-sized bitch, not pregnant; the experiment began on March 12th and she was killed on April 16th (34 days). For the first 23 days 1 lb. of meat was given daily. From that date until the end of the experiment, with the exception of two days when nothing but lung was given, 2½ to 3 lb. of meat were allowed. For the last three days lung was given with the meat. The animal became very constipated, going for three to four days without passing fæces. On three days in the week immediately preceding its death it passed large amounts of soft, light-coloured fæces (almost diarrhœa), and then again became constipated. The urine remained normal except for an occasional trace of albumin. No casts were found. The dog was killed by an intracardiac injection of potassium cyanide. The colon was found to be comfortably filled with dark, hard fæces. The small intestines were nearly empty. The liver was congested and showed areas of subcapsular hæmorrhage. The kidneys appeared to be fairly normal. The capsules were adherent in one or two places.

FIG. 5.

(Dog 32.) Section of kidney showing parenchymatous degeneration especially affecting convoluted tubules.

On microscopical examination of the *liver* the whole section shows marked degenerative changes. There are areas of cellular necrosis scattered through the sections and many areas showing hæmorrhage in the periphery of the lobules (Fig. 4). There are also a considerable number of areas showing collections of leucocytes, usually in association with necrotic liver cells. Many of the capillaries and veins show thrombosis. The *kidneys* show a moderate degree of parenchymatous degeneration. The glomeruli appear to contain an excess of endothelial cells.

I am not yet in a position to say whether the hæmorrhages in the liver of dog 35 were caused merely by giving two to three times the amount of meat allowed to the other dogs or whether the lung (containing as it does a rich supply of fibrinogen) added to the diet had this effect. I am disposed for the present to believe that the important factor was the increase in the amount of meat.

It is thus clear that simply by feeding dogs on a lean meat diet, we can produce a parenchymatous degeneration of the kidneys and severe degeneration of the liver with the following changes: (1) recent and hyaline thrombi in the veins and capillaries; (2) collections of leucocytes in the lobules; (3) fatty and other types of degeneration; (4) areas showing cellular necrosis; (5) areas of hæmorrhage in the periphery of the lobules. Any poison may affect any or all portions of the lobule depending on its concentration in the blood and route of entry. In the toxæmias of pregnancy, eclampsia included, the centre and middle portions of the lobule are more often affected than the periphery, although the areas of hæmorrhagic necrosis, when present, are more frequently encountered in the periphery of the lobule.

It will be observed that I have not been able to procure a pregnant bitch for experiment earlier than 14 days before its confinement.

Conclusions from the Experiments.

(1) Eclamptic blood is not markedly toxic to pregnant bitches.

(2) Sodium and potassium oxalate cause dogs to die with convulsions. These drugs cause severe degeneration of the liver and kidneys, but the animals may nevertheless be saved by the intravenous administration of calcium.

(3) Guanidine carbonate causes a rapid and prolonged rise in the systolic blood pressure in dogs. It has a very much more toxic effect if the blood calcium be previously lowered.

(4) Separation of a portion of the placenta causes no toxæmic symptoms in pregnant bitches.

(5) If intestinal stasis be caused by closing the anus the liver and kidneys become severely damaged. These changes occur whether the animal be pregnant or not, but are more marked and occur more quickly if the bitch be pregnant.

(6) A lean meat diet given to dogs for about 30 days causes the following effects: (*a*) A marked constipation associated in every case with patches of hyperæmia in the small intestine, particularly the jejunum, which on microscopical examination show the villi to be denuded of their epithelial covering and undergoing degeneration. (*b*) A parenchymatous degeneration of the kidneys, especially affecting the convoluted tubules (Fig. 5). (*c*) Severe degeneration of the liver, with cellular necrosis and peripheral hæmorrhage.

(7) A lean meat diet if given to bitches early in pregnancy causes death of the fœtuses.

(8) A parenchymatous degeneration of the kidneys is not necessarily associated with albuminuria. A marked albuminuria did not occur in any of these dogs.

(9) The damage to the kidneys is slight compared with the severe damage to the liver.

SUMMARY.

1. Eclampsia is neither caused by a placental toxin, nor by any functional or organic lesions in the kidneys.

2. The defensive forces of the body are compromised by pregnancy in several ways: (*a*) the liver has to undertake duties both for the mother and the fœtus; (*b*) anxieties associated with pregnancy and the bulk of the uterus may prevent the proper digestion and assimilation of food; (*c*) the fœtus requires considerable quantities of sugar, about 8·0 g. of calcium and corresponding amounts of other important substances during the last four weeks of pregnancy.

3. Deficiencies in the diet are exposed by pregnancy.

4. Intestinal stasis, aggravated by the bulk of the uterus and by the fixing of the fœtal head in the pelvis, causes an increased absorption of toxins.

5. A lean meat diet causes severe changes in the livers and kidneys of dogs. This diet contains all the vitamins but very little calcium.

6. This diet causes death of the fœtus if given to bitches sufficiently early in pregnancy, and it is probable that human abortions, for the majority of which no adequate explanation can be offered, may be caused by deficiencies in the diet.

I submit that one is, therefore, justified in deducing from the known facts about eclampsia, together with the results of the experiments recorded, that the disease is caused by toxins absorbed from the intestinal canal, which, owing to a breakdown in the defences of the body, are not detoxicated. The success of the various expectant methods of treatment, which are all based on that in use in the Rotunda Hospital and first described by Tweedy in 1896, as well as the brilliant results obtained by antenatal care, testify to the truth of this.

I have attempted to elaborate my thesis by suggesting that a deficiency of ionised calcium in the blood is the cause of the breakdown of the defences of the body. Whether this suggestion be true or not in no way vitiates the truth of the main hypothesis.

The following are the main points of the elaboration:

(1) It is probable that calcium is the chemical most closely concerned in protecting the body from toxins, and that it can only exercise such functions when in an ionised form.

(2) The available maternal supply of calcium may be deficient for the following reasons: (*a*) deficient intake; (*b*) deficient absorption; (*c*) increased elimination associated with an acid urine; (*d*) a certain amount is used for making colostrum; (*e*) the fœtus requires heavy supplies; (*f*) vitamin D is required for its proper use and may be deficient.

(3) A damaged liver cannot properly metabolise meat so that the amount of guanidine in the blood is increased. Guanidine is antagonistic to calcium and lowers the blood-sugar.

(4) A damaged liver is associated with a deranged metabolism which may express itself in a variety of ways. Its failure to produce antithrombin would allow the excess of fibrinogen in the blood to cause hæmorrhages in various parts of the body.

(5) The fits may be caused by: (*a*) a sudden drop in the blood-sugar associated with a hypocalcæmia; (*b*) by œdema of, or hæmorrhages into the brain; (*c*) by the toxins acting directly on the central nervous system.

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A FATAL NEURO-PARALYTIC ACCIDENT OF ANTIRABIES TREATMENT.

BY G. STUART, O.B.E., M.D. ABERD., D.P.H.,

AND

K. S. KRIKORIAN, M.D. BEIRUT.

(*From the Central Laboratories, Department of Health, Government of Palestine.*)

THIS paper is written primarily to record a fatal case of acute ascending (Landry's) paralysis which recently followed on treatment at the Central Anti-Rabies Institute, Jerusalem.

The patient was an unmarried agricultural labourer, aged 24 years, a Jew of Russian extraction, resident in Palestine eight years. The family history contained no affections of the nervous system and no evidence of mental disease, paralysis, or fits. There was nothing in the patient's occupation, mode of life, or environment likely to injure health or predispose to nervous instability. He had had benign tertian malaria for several months during 1928, but otherwise no acute illness or infectious disease. There was no abnormality in the circulatory system and no chronic renal disease.

On Dec. 27th, 1929, he was bitten in a rural district by a stray dog which had escaped after having, unprovoked, inflicted a single wound of moderate severity on the upper extremity through the clothing. The wound was not cauterised; there is no record of other persons or animals bitten at the same time. On Jan. 1st, 1930, antirabies treatment was begun at his request, and continued until Jan. 14th, when a full course of injections had been administered. During his period of attendance his conduct was exemplary; no local accidents or accidents with a local

point of departure occurred, and he showed no signs of nervousness and remained well throughout.

On Jan. 14th, in the afternoon, some six hours after receiving the last injection, while shaking hands with a friend, he experienced a feeling of weakness in the right arm; towards evening he was compelled to lie down on account of numbness in the legs. On Jan. 15th he could not pass urine or lift his arms, and was admitted to hospital.

He was strong and athletic looking; his temperature was 98° F., his pulse-rate 90–96, and the pulse regular but somewhat weak. His respiration-rate was 25. His tongue was coated but his tonsils and pharynx were normal. The pupils reacted promptly to light and to accommodation, and his mind was perfectly clear. He complained of nausea and of a slight pain between the shoulder-blades. There was total flaccid motor paralysis of both inferior extremities; limited movement of the arms was still possible. The patellar tendon reflex and abdominal reflex were abolished, but Babinski's sign was not elicited. There were no sensory disturbances in the extremities, and the tactile pain and temperature senses were unaffected. The heart and lungs were normal, there was no enlargement of the abdomen, no pain on pressure, and the spleen and liver were not palpable. The urinary bladder was distended, reaching to within 8 cm. of the umbilicus. There was retention of fæces and urine, necessitating the use of a catheter. The urine was free from albumin, sugar, bile-pigments, and other pathological constituents. After catheterisation the patient was given 0·05 g. luminal (phenobarbital). He slept badly, suffering from nausea and vomiting, and was only able to retain a little tea. On Jan. 16th his temperature was normal but his pulse very frequent and irregular, and he had complete motor paralysis of both arms.

After injections of strychnine, lobeline, and hexetone (a camphor preparation: methyl-isopropylcyclohexenon in solution with sodium salicylate) improvement in his general condition was noted; the pulse became more satisfactory and the nausea disappeared. Constipation was relieved by an enema. During the night direct transfusion was performed, 700 c.cm. of blood being taken from a donor who had lately received identical antirabies treatment; a slight feeling of chill but no temperature followed the operation.

During the forenoon of Jan. 17th the patient felt better, took nourishment with considerable appetite, and passed urine freely; the motor paralysis of both extremities remained unchanged. His temperature was 98·6° F. and his pulse 90, strong and regular. Late in the afternoon he complained of heaviness and pressure, feeling as if a large stone were resting on his chest. At 10 P.M. salivation became markedly increased, and he frothed at the mouth without cessation. He was fully conscious and complained of difficulty in breathing. At 4 A.M. on Jan. 18th respiration ceased, the pulse continuing to beat for a few seconds more.

This summary of the clinical course and therapeutic measures has been prepared largely from notes supplied by Dr. Ben-Shabetai, physician to the Shaare Zadek (Jewish) Hospital, Jerusalem.

A pathological condition presenting as its main features a rapidly advancing (flaccid) paralysis, without fever, without sensory changes, without loss of sphincter control, and terminating fatally within a short time from involvement of the bulb, is characteristic of a paralysis of the Landry type.

The vaccine employed was a 2 per cent. emulsion of fixed virus brain killed by the combined action over 24 hours of heat at 37° C., and of 1 per cent. phenol, and diluted to half with physiological saline solution prior to use. Treatment consisted of the daily administration, over 14 consecutive days, of 5 c.cm. of killed carbolised virus, and the paralysis, which occurred six hours after the fourteenth injection, followed on the introduction of 0·7 g. of nerve substance.

"The doctor should, above all, bear in mind the old adage, *primo non nocere*, and, as Roux was the first to advise, will avoid any active or progressive medication and will let the disease follow its natural course." (Remlinger, 1927.)

From this standard there was, in the present instance, obvious departure. The blood transfusion, surely without precedent in the treatment of such accidents, was carried out as a result of deliberation among the consulting staff of the hospital. Their recommendation appears to have been based on a belief that the condition was due to a lack of antibody to nervous substance in the patient's tissues; this want, it was argued, might be supplied by blood transfusion from a treated person who, remaining unaffected by the injections, presumably possessed such antibody. After two preliminary failures to find a suitable donor—both sera hæmolysed the patient's red cells—success was achieved in the person of a young volunteer who had completed antirabies treatment on Jan. 4th. According to Babes (1912), the serum of animals and of persons immunised against rabies may develop hæmolytic properties; the hæmolysis resulting from the admixture of the patient's corpuscles and the two original sera investigated might thus be explained.

Notes on Neuro-Paralytic Accidents in General.

(*a*) *Varieties.*—The clinical forms of paralysis encountered during and following antirabies treatment, and inseparably linked with its administration, present great diversity. Classification based on their degree of intensity, however, gives three main types: neuritic forms or simple localised paralyses from involvement of peripheral nerves (35 per cent.); dorso-lumbar myelitis (30 per cent.), and paralysis of the Landry type (35 per cent.). The percentages are those given by Avezzu (1923). They occur normally within 35 days of commencement of treatment. The greatest incidence falls within the first three weeks, and the earliest date of onset recorded is the fifth day (Brault, 1897). There is no connexion between the date of the bite and the appearance of symptoms. The most serious cases occur during the second week of treatment; in the milder forms the onset is commonly delayed to the end of treatment, or after. The mortality-rate in Landry's paralysis is 30 per cent., in dorso-lumbar myelitis 5 per cent., in neuritic forms nil.

(*b*) *Pathology.*—Those parts of the cord affected show obvious softening, and the distribution of lesions through white and grey matter alike renders differentiation between these components impossible, the whole cord surface presenting a homogeneous greyish-pink appearance. Microscopically the characteristic lesion is a perivascular demyelination, indistinguishable from that of a subacute disseminated sclerosis.

"The vessels are surrounded by a broad embryonic zone, around and attached to which is a network, formed in large part by a proliferation of neuroglia and connective tissue cells." (Babes and Mironesco, 1908.)

The complete histology has been described by Perdrau (1928).

(*c*) *Incidence.*—The frequency of occurrence per 1000 persons treated is variously estimated: thus, according to Babes it is 1·3, to Pelser 0·77, to Simon 0·48, to Remlinger 0·37, to the findings of the 1927 Rabies Conference 0·28. This disparity is to be accounted for by the "inexactitude of the present statistical bases" (Lubinski and Prausnitz, 1926). The figures prove, however, that the condition is relatively rare, and the degree to which it complicates treatment with killed carbolised virus may be gauged from the fact that up to the present there are on record only seven cases, as follows: at Lemberg, one accident among 2213 patients treated—an incidence-rate of 0·218 per 1000; at Jerusalem two among 5409, or 0·37 per 1000; at Kasauli two among 7296 Europeans and one among 77,548 Indians, or 0·27 and 0·013 respectively per 1000 treated persons. The seventh case is from Aquila, one of the dispensaries supplied by Puntoni, and has been described in detail by Alessandrini (1928). Post-treatment paralysis is almost unknown among children and elderly patients and males and females are almost equally liable. Susceptibility is more marked among Europeans than among the natives of tropical countries, and educated people are more readily attacked than those engaged in manual labour. Cases occur, cæteris paribus, at any time during the year without apparent reference to month or climatic condition. While the occurrence of paralysis is unaffected by the nature of the biting animal, the method of treatment and individual predisposition undoubtedly play predominant parts in causation.

(*d*) *Ætiology.*—During the period 1925–28 we made investigation into the ætiological factors responsible for the production of post-treatment

paralysis. The results of animal experimentation strengthened the evidence gained from a study of the condition in human beings. The principal findings of the inquiry, published elsewhere (1928), may be summarised as follows :—

From Results of Experiments on Rabbits and White Rats.

1. Though nervous substance may induce anaphylactic shock, paralytic symptoms are not anaphylactic phenomena.
2. Fixed virus and rabies "toxin" are not concerned in the production of paralyses.
3. Accidents follow the exhibition of brain substance, whether normal or rabid.
4. Homologous and heterologous nerve substance alike induce the condition.
5. The *causa causans* is to be found in the protective inoculations themselves, presumably in some constituent of normal nerve substance unavoidably introduced during immunisation.
6. The deleterious, paralysis-provoking substance present in normal (and equally in rabid) nerve tissue can definitely be rendered innocuous to rabbits and rats by appropriate treatment with 1 per cent. phenol.
7. There appears to exist, within limits, no relationship between the occurrence of accident and the total mass of nerve substance injected. The actual quantity of nerve substance introduced, therefore, is not per se a determining factor ; further, absence of such relationship argues strongly in favour of individual hypersensitiveness to the inocula being a principal cause.

The cause, therefore, lies in some constituent of brain substance which is rendered innocuous by the action of phenol. The actual occurrence of accident is governed by predisposition or idiosyncrasy.

From an Examination of the Several Theories of Causation.

1. An explanation of the occurrence of post-treatment paralysis does not need to be sought in subjective phenomena, psychic or hysterical, in street virus rabies attenuated by treatment, street virus, fixed virus, rabies "toxin," enzyme or ferment action, anaphylaxis, accidental bacterial infection, neurotropic virus, or the *genius epidemicus* of Kraus.
2. The cause of paralytic accident lies in the antirabies injections themselves, and more specifically in some component of nerve substance necessarily introduced during the process of immunisation, perhaps in a cytotoxin.
3. Incidence has been reduced to a negligible percentage at institutes where use is made of fixed virus and its—for practical purposes—inseparable vehicle, nerve substance, which has been reduced in concentration or exposed to certain chemical or physical agents. Thus, safety can be achieved by the administration either of emulsions of unaltered nerve substance in high dilution or of emulsions of nerve substance previously subjected to the action of phenol, ether, glycerin, phenol + heat or desiccation—all of which modifications of the original Pasteurian method permit the exhibition of relatively large dosage of vaccine.
4. While the occurrence of paralytic accidents is determined not by the quantity but by the quality of the nerve substance introduced, the vital importance of individual predisposition must be recognised.

Conclusions.

Paralytic accidents can be produced experimentally in a small percentage of cases by the repeated inoculation of nerve substance, whether normal or rabid, homologous or heterologous. In rabbits and white rats it can be prevented by exposure of brain suspensions to the combined action of phenol (1 per cent.) and heat (37° C.) over 24 hours. Apparently in the basic nerve substance of all antirabies vaccines there exists some deleterious component which, although adversely affected by several physical and chemical agencies, is still capable in peculiarly susceptible human beings of exciting symptoms of those nervous disorders classified as the paralytic accidents of anti-rabies treatment. It is as yet impossible to say whether the whole or only part of the nerve substance is to be incriminated. To ascribe causation to fat, lipoid, or a similar component, ether-destructible or ether-soluble, is untenable, as cases of paralysis have followed treatment by Alivisatos's (ether) method. Again, while it is the belief of the majority that a solution will ultimately be found in the action of the protein constituent, actual proof is still wanting, for, no matter what modifications of Pasteurian treatment have been employed, no matter to what degree protein must by such means have been altered or denatured, accidents have surely, if rarely, supervened. Although, therefore, the nerve substance of the inoculations is without doubt primarily responsible, its paralysis-provoking toxic constituent has not yet been determined with certainty. Actual occurrence, however, is governed by individual idiosyncrasy—i.e., relative intolerance to foreign inocula.

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Clinical and Laboratory Notes.

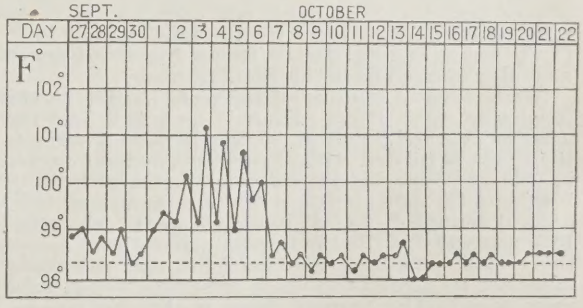
A CASE OF CONCURRENT HERPES ZOSTER AND VARICELLA.

By John N. Cumings, M.B., M.R.C.P. Lond.,
late house physician to king's college hospital.

A girl, aged 19, was admitted to hospital on August 28th, 1929, suffering from a badly lacerated right arm.

On Oct. 1st her temperature began to rise (see chart). On the 2nd it was 100·2° F. at 6 P.M., but there was no apparent cause. On the morning of the 3rd she complained of stiffness and neuralgic pains on the right side of her neck, together with some earache. By the afternoon of that day a slightly swollen and reddened area about 1½ in. × 1 in. was present on the lower jaw on the right side, just anterior to the angle. There was a single enlarged and tender right submaxillary gland. That evening the temperature was 101·2° F. with a pulse-rate of 96.

On the 4th pain was still present, although diminished in intensity ; the submaxillary gland was less tender, and



there were a few palpable cervical glands on the right side. Over the reddened area, which had been noticed on the 3rd, could now be seen a number of typical vesicles of herpes zoster. There were also a few on the helix of her right ear and one or two on the scalp just above the ear. There was a stinging sensation over the affected area. A number of small vesicles were found scattered on the trunk, particularly on the right side, over the shoulder, the back, and the abdomen. These all resembled the vesicles of varicella, although they were a little smaller than usual. There was no stinging sensation over the trunk but itching around the area of each vesicle was present.

On each of the three succeeding days a fresh crop of vesicles appeared on the body. On the first of these three days a few more appeared on the back and the abdomen ; on the second day a smaller number on the upper part of the neck and lower part of the scalp, and a few on the legs ; whilst on the third day one appeared on the right ring finger. All these were smaller than usual, resembling in size those that were present on the 4th. They were more

numerous on the right side of the body than on the left side, although both sides were affected. The vesicles became pustular, finally forming scabs and healing. On the 14th the lesions on the face were completely healed, but the spots on the body did not disappear until the 21st.

The temperature chart shows the accompanying general disturbance.

It is of interest to note that another patient in a bed on the opposite side of the ward, admitted on Sept. 9th, developed on Sept. 25th herpes over the area supplied by the left seventh thoracic nerve. She was discharged on Sept. 29th. Whether this has any connexion with the case recorded it is extremely difficult to say, for as far as is known these two patients never came near each other or had anything in common, but there are records of varicella infection from contact with herpes zoster.

I have to thank Dr. C. F. T. East and Mr. Harold Edwards for their permission to publish this case.

A NOTE ON CHANGES IN THE BLOOD-PLATELETS AFTER OPERATIONS AND INJURIES.

By B. Willinsky, M.D. Toronto.

(From University College Hospital Medical School.)

Dawbarn Earlam and Howel Evans[1] showed that surgical operations of any but the most trivial kind are generally followed by an increase in the number of platelets in the circulating blood; the same thing happens in most cases of normal childbirth and is very marked after Cæsarean section. They showed also that the rise in the platelet count is associated with a diminution in the clotting time of the blood and they suggest that it has a good deal to do with the occurrence of post-operative thrombosis. The platelets usually reach their maximum at about the tenth day, the time at which thrombosis is most likely to occur. There is no change in the count after anæsthesia, simple hæmorrhage, or stopping in bed, and the common feature which excites the reaction seems to be tissue injury. Their observations seemed so important in relation to the troublesome question of post-operative thrombosis and embolism as to be worth confirmation, and with the kind help of Prof. C. C. Choyce and Mr. Julian Taylor I have examined a number of cases from this point of view.

After trying a number of methods I came to the conclusion that Howel Evans's technique was the most reliable and practical. Using paraffined surfaces the blood is diluted with 2 per cent. sodium citrate in 0·29 per cent. sodium chloride stained with cresyl blue, and the ratio between platelets and number of cells determined in a hæmocytometer chamber. It is necessary to use the utmost care to have everything clean and free from particles, and the blood must not be diluted too much or contact hæmolysis[2] may occur. The normal range is, by my counts, from about 200,000 to 600,000 with an average of rather less than 400,000 per c.mm. in the adult male and around 350,000 in the adult female.

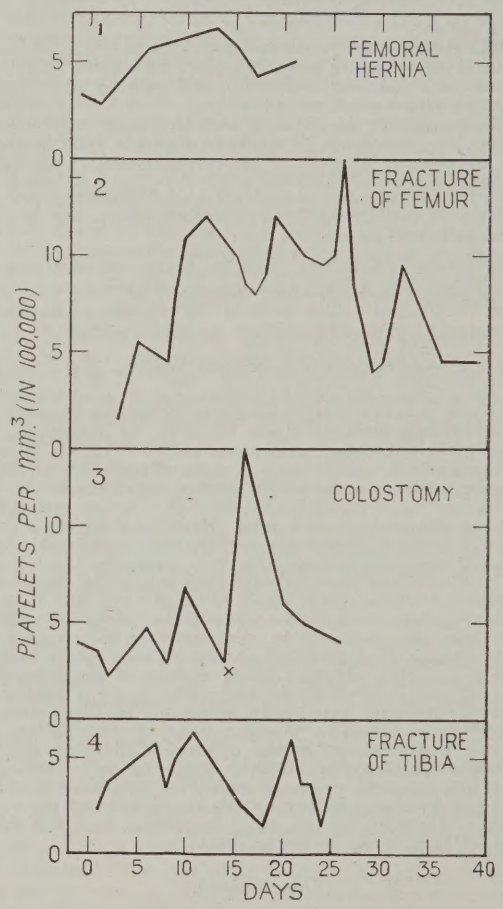
In the majority of cases a rise of some degree occurred. Fig. 1 shows a response to the radical cure of a femoral hernia. An extensive comminuted fracture of the femur, without an external wound or any operative interference, gave the interesting result shown in Fig. 2, in which case there is no obvious cause for the platelet increase except tissue injury. In Fig. 3 a moderate rise followed the first stage of a colostomy and the trivial disturbance of opening the bowel led to a count of more than one and a quarter millions. Fig. 4 illustrates the unexplained ups and downs which may be found (fractured tibia).

[1] Earlam, D., and Evans, H.: Jour. Path. and Bact., 1928, xxxi., 833.

[2] Price-Jones, C.: Ibid., 1924, xxvii., 111.

Additional examples of the post-operative increase are:—

Salpingectomy: 470,000 to 720,000 on third day.
Inguinal hernia: 315,000 to 600,000 on fifth day.
Colostomy: (1) 500,000 to 1 million on second day; (2) 440,000 to 1 million on second day.
Prostatectomy, first stage: 250,000 to 650,000 on sixth day.
Adenoma of breast: 290,000 to 510,000 on sixth day.
Carcinoma of breast: 215,000 to 640,000 on thirteenth day.
Hæmorrhoidectomy: 350,000 to 890,000 on seventh day.
Fractured humerus: 180,000 to 600,000 on thirteenth day.
Compound fracture of tibia and fibula: 290,000 to 850,000 on eleventh day.
Compound fracture of femur: 375,000 to 620,000 on fourteenth day.



Platelet counts in four typical cases mentioned in the text.

A fractured femur, an adenoma of the breast, a gastro-enterostomy, an umbilical hernia, a prostatectomy (second stage), and an injection for varicose veins showed no change. In five instances there was a fall; their preoperative level was high:—

Femoral hernia: 590,000 to 160,000 on eighth day, to 370,000 on tenth day.
Prostatectomy (second stage): 470,000; gradual fall to 310,000 on twenty-fourth day.
Ischio-rectal abscess: 550,000 to 220,000 on eleventh day.
Gastro-enterostomy: 510,000 to 180,000 on fourth day, to 520,000 on sixteenth day.
Appendectomy: 450,000 to 110,000 on fifth day, to 565,000 on thirteenth day.

Several cases showed a slight fall on the first day after operation which does not seem to have been previously noticed. The bone cases showed a rise after manipulation and, taken together, entirely support the view that the increase of platelets is caused by tissue injury, presumably by the absorption of the products of autolysis into the circulation.

No post-operative thrombosis occurred in any of these cases.

For observation of amœboid movement of platelets all vessels and slides must be carefully cleaned. Acids must be avoided in cleaning glassware, which should be washed in distilled water for many hours and dried with pure filter paper before use. There must be no trace of acid or alkali on coverslip or slides, or the counts will be inaccurate. The diluting fluid must not come into contact with rubber or cork, and in mixing the diluted blood bubbles must be avoided or the counts will be valueless. It seems probable that the destruction of platelets is chiefly due to loss of carbon dioxide with alkalinity in the reaction of the blood. Change in reaction of blood is sufficient alone to produce destruction. The diluted blood may remain in the wax cup for half an hour without any noticeable change in the platelet count, but disintegration of platelets follows rapidly when they are allowed to come into contact with water-wettable surfaces. Therefore, the counting should be started within ten minutes after the diluted blood is introduced into the hæmocytometer. If reasonable care is used the counting of blood-platelets is no more difficult than an ordinary red blood-cell count, and the universal adoption of platelet counting will undoubtedly help to solve many of the hitherto unexplainable changes in the blood following operations and injuries.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

A MEETING of this Section was held on May 16th, with Dr. A. E. GILES in the chair.

Causation of the Toxæmias of Pregnancy.

Dr. G. W. THEOBALD read parts of the communication which we publish on p. 1115.

Mr. L. C. RIVETT did not think he had ever listened to a more interesting paper. The thesis advanced in it was very important, and every investigation possible should be made to test it.

Mr. EARDLEY HOLLAND said he had been for some time interested in the work of Minot on hyperglycæmia and calcium deficiency in the toxæmias of pregnancy. For a year, at London Hospital, cases of eclampsia and "acute yellow atrophy" had received glucose and calcium intravenously. Though he had not been much impressed by the results in pure eclampsia there had been two remarkable successes in bringing back to life two patients with acute yellow atrophy who were almost moribund. For twenty years the same theory had been accepted by the profession, but he had long felt that a suitable diet was one of the most important factors in the prophylaxis against these toxæmias.

The PRESIDENT also congratulated Dr. Theobald and expressed his appreciation of the thought and labour put into his research. The absence of real discussion he attributed to the need for a quiet assimilation of the contentions advanced.

Results of Hysteropexy.

Dr. MACDONALD reported that as a result of recent comments on hysteropexy figures he had looked up the records from 1920–29 inclusive. These were under three headings: (*a*) hysteropexy done alone for retroversion; (*b*) hysteropexy for polypus; (*c*) the operation performed incidentally for other purposes. 269 hysteropexies for retroversion were followed by no deaths. Under (*b*) there were 426 cases, with seven deaths; under (*c*) 236, with two deaths. In the course of 20 years there were 565 cases of hysteropexy alone with no reported deaths. Four of the seven deaths under (*b*) were due to pulmonary embolism, two to heart failure, and both were over 60 years of age. The other death was from ileus. Under (*c*) one death was from pulmonary embolism, the other from acute phthisis.

The PRESIDENT said his own figures in the same connexion were: hysteropexy for retroversion, four deaths in his first 214 cases; in his last 629 cases, no deaths; in hysteropexy for prolapse, 342 cases, no deaths; for procidentia, two deaths in his first 89 cases; and in the last 45 cases two deaths. Altogether there were 1443 cases, and the last death was in April, 1920, the patient being a woman aged 73.

Mr. T. G. STEVENS expressed his admiration of the figures which had been quoted, but contended that the story at cottage hospitals would be a different one. Hysteropexy was a cottage hospital operation, rather than colporrhaphy.

A Case of Endometrioma.

Dr. F. J. HECTOR described the case of an unmarried woman, aged 26, who was admitted into hospital for the first time in September, 1921, her complaint being of severe dysmenorrhœa.

There was a fixed retroversion and a slightly enlarged uterus. On laparotomy the uterus was found to be held down by dense adhesions, and the left tube and ovary were adherent to the pelvic floor. The adhesions were separated, and the left tube and ovary were removed. There were numerous follicular and retention cysts, and in the tube were chronic inflammatory changes. Nine months later there was a persistence of dysmenorrhœa, with considerable pain in the left iliac fossa, accompanied by vomiting and a feeling of incapacity. A second abdominal section was therefore carried out, and numerous masses were found, resembling fibroids. Subtotal hysterectomy was performed. There was a very hard mass at the base of the left broad ligament, involving a portion of the left ureter, which was kinked and was found to have been occluded. Resection followed, and an end-to-end anastomosis was done. The uterus contained a soft interstitial fibroid, and the endometrium was thickened and showed some polypoid growths. The report was "benign adenomatous polypus of the endometrium." The patient was free from symptoms for four years. Then in 1926 she had an offensive brown vaginal discharge, which became bright red at monthly intervals. An almond-sized polypus was removed, which seemed to be undergoing cystic degeneration. Eighteen months later the discharge recurred, and three friable polypi were removed. They consisted of endometrial tissue embedded in a fine stroma, with some muscular tissue. Three applications of radium were given. Bleeding was now less, and the indurated plaque was smaller.

If radium treatment could be carried out for endometrioma it would be all to the good, said Dr. Hector, for it would save embarking upon a mutilating operation which, in a young woman, was a serious matter.

Dr. J. P. HEDLEY agreed that it might be difficult to deal effectively with an endometrioma, but in using radium one had to consider the secondary effect on the ovaries of a young woman. Hence the policy of applying radium so as to avoid a serious operation was a questionable one. With a woman near the menopause the application of radium might be preferable to a dangerous operation.

Dr. JAMES WYATT asked whether in this case the radium had a direct action on the growth in the vagina.—Dr. HECTOR replied that at present little was known of the effect of radium on the growth. No change was observed in this growth after radium was applied, but the plaque was reduced.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

AT a meeting of this Society recently held at Liverpool, with Dr. J. W. BURNS, the President, in the chair, Dr. H. H. GLEAVE (Liverpool) read a note on

Endometrial Autotransplants in the Rabbit.

He quoted the results of observations on 45 rabbits in which shavings of endometrium were tied into

an incision in the liver. These developed into enormous cysts, which, however, reached a maximum of growth in two months and were no bigger a year later. The papilliferous condition of the uterus seen in rabbits in pregnancy or pseudo-pregnancy was exactly reduplicated, he said, in the endometrium of the cyst from the influence of the corpus luteum hormone. Similarly, during œstrus the rabbit showed cysts with thickened endometrium like the blunt folds of the uterus. After oöphorectomy both uterus and cyst atrophied, but the injection of 25 rat units of œstrin daily for a week restored the endometrium to the œstral type. Injections of pulped endometrium into the ear vein gave negative results. Vascularity of the site of implantation favoured the taking-root of the implant, and he considered the muscle of the implantation cyst arose from the graft itself and not by metaplasia of the local tissue. These experiments, he considered, offered support to Sampson's theory of the origin of endometriomata.

Dr. J. W. A. HUNTER (Manchester) considered there were two main factors in the growth of human endometrioma—namely, implantation and devitalisation at the site of implant.

Prof. W. BLAIR BELL disagreed that the papilliferous condition of the rabbit endometrium was always due to pseudo-pregnancy, and said it could occur as a result of long-continued œstrus.

Prof. J. H. DIBLE (Liverpool) thought the experiments mainly demonstrated that the endometrium of the cysts and uterus was in the same condition at any one time.

Prof. D. DOUGAL (Manchester) described a case of endometrioma of the abdominal wall occurring in a married nullipara aged 44 years.—Prof. BLAIR BELL reported a case of acute puerperal inversion of the uterus, and Dr. M. M. DATNOW showed a specimen of primary ovarian pregnancy in which Spiegelberg's criteria had been fulfilled. He also showed a calcified dermoid which had caused no symptoms.

CHELSEA CLINICAL SOCIETY.

THE annual general meeting of this Society was held at the Rembrandt Hotel on May 20th, with Mr. L. A. HARWOOD, the President, in the chair. A discussion on

SLEEP

was opened by Dr. S. A. KINNIER WILSON who said that the curious paradox of sleep was that its disorders were familiar, while its mechanisim was little understood. Sleep disorders were becoming more common, a large number of cases being associated with encephalitis lethargica, whose appearance in 1919 reawakened interest in the whole subject. Hypersomnia used to be very rare, but was now often seen in encephalitis, being sometimes the only early symptom. Invasion of the sleep rhythm was another novel disorder, an organic affection revealing itself in a disturbance of function. It was incorrect to speak of a "sleep centre." Sleep was a process in time and could not be localised by static or anatomical rules, any more than the tune in a musical box could be localised. On the other hand, there was evidence that sleep was disturbed in encephalitis and brain tumours, especially when the lesion was at the floor of the brain in the third ventricle, by the stalk of the pituitary. Oversleeping must be a positive symptom—the overworking of the sleep mechanism. The tumour could not be destroying the sleep mechanism; it must be causing it to overact. Pavlov had shown that after a certain number of repeated stimuli, the reflex arcs ceased to respond and the animal fell asleep. Sleep, according to this great authority, was merely inhibition. When it descended to the lower centres, the organism fell asleep; when it was spread over the cortex, the symptom of catalepsy or trance was produced.

In recent years another disorder of sleep had appeared — narcolepsy. Sir William Gowers had referred to it in 1907, but Dr. Wilson said that he had never seen a case until 1926, since when he had seen over a score. The reason was unknown. The patient suffered a fit of sleep, and at once reawoke; the phenomenon was a kind of epileptic attack of sleep, not connected with Fröhlich's syndrome or pituitary tumour. It was related to cataplexy, in which the limbs gave way on hearty laughter or apprehension. This phenomenon was an extreme form of the familiar slackening of motor control due to emotion. Dr. Wilson hinted at an association between this syndrome and encephalitis lethargica. A large number of patients put on weight, sometimes two and a half stone in a year. In cataplexy the deep reflexes were completely abolished, to return immediately the attack was over. During the attack the patient was an organic case. The value of reflex tests, said Dr. Wilson, was thereby rendered very doubtful, and the evanescence of these signs, which he had always considered constant and immutable, in these cases had completely altered his attitude to them. They could only be dynamic and physiological changes occurring in mechanisms. We should not, he said, talk so much of diseases, but more of reactions to stimuli. Symptoms, even that of sleep, were signs that the mechanism producing them was active and healthy; this view of nervous symptoms was more interesting and threw a truer light on nervous diseases than the present concept.

Sleep in General Practice.

Dr. P. SEYMOUR-PRICE said that the chief difficulty of the clinician investigating sleep disorders lay in obtaining a reliable account of them. No one really knew exactly when he went to sleep, and it was common to wake up refreshed after two hours' sleep. The evidence supplied by a patient was still less trustworthy. Sleep was a relative term, and it was easy to acquire the habit of doing with very little. Voluntary insomnia for several nights had been shown to produce no symptoms beyond a certain lack of concentration, which a good night's sleep would restore. Insomnia was often, like diet, a fad, a phobia, and a fetish, and became itself the cause of sleep disorder. There seemed to be a newspaper conspiracy to suggest insomnia to the public. The reason for the high incidence of sleep disorders was a general increase in worry, excitement, or anxiety; the times imposed hurry and forbade leisure. The ordinary type of insomnia was associated with slight nerve exhaustion, fatiguability, and indigestion. It was no use trying to go to sleep or counting sheep; the patient should let himself glide to sleep.

Insomnia was a habit, and any simple sedative plus suggestion would often work a cure. His formula was a cachet containing grs. 5 each of aspirin and sodium bicarbonate, but the aspirin should be given its chemical name.

Dr. Seymour-Price had never known any ordinary sedative form a habit. Nevertheless, prescriptions should be for a limited amount and be marked *ne rep.*, as they were otherwise usually handed on. The tolerance some patients acquired to hypnotics was extraordinary. He had known a patient drink, without harm, half a pint of bromidia, which could be obtained in this quantity without a doctor's certificate. Few patients really needed a prescription; most of them wanted advice, not drugs. A hyperpietic could be bludgeoned into sleep with a powerful narcotic, but unless the condition was treated this practice was unsound. Many patients took grs. 10 of medinal night after night for months, but a drug which would produce artificial sleep in this way must produce moral, mental, or physical degeneration, or all three. Such patients were in a chronic state of intoxication, slept very poorly, and were inert and apathetic. Even bromide, given for long enough—except for definite conditions, such as epilepsy—did irretrievable harm.

Much spade-work of suggestion was needed from the profession. Fear of insanity, fear of the dark, fear of sleep because it imitated death, fear of drugs as habit-forming, were all very common obstacles to treatment. They could not be dealt with by articles in the lay press; what was needed was the treatment of each case on its merits—the *argumentum ad hominem*. The public were on the whole utterly ignorant of the laws governing the important functions of diet and sleep, and it was the business of the profession to educate them.

Discussion.

Mr. RALPH THOMPSON asked if the limbs of a sleeping man became atonic, how it had occurred that in the retreat on Corunna a large number of soldiers had marched asleep. There was great difference between the tone of sleep and of paraplegia. He asked for explanation of the fact that ten minutes' sleep was as refreshing as ten hours'. He had once been deprived of sleep for three weeks by a painful affection of the knee, no drug being of any use, but had not suffered any particular harm. He recommended in difficulty the imagination of a black target in a black landscape. He did not believe that drugs such as aspirin formed a habit in a person of common sense. He asked whether the knee-elbow position of some healthy children in sleep was a phylogenetic reminiscence of arboreal life.

Dr. G. MURRAY LEVICK remarked that it was as well not to place too much credence in the report of the night-nurse. A patient lying still and awake was often reported asleep. The patient was the more trustworthy witness, unless the night-nurse made a very careful examination. Patients nursed in bed had no fatigue products, which played a large part in producing sleep.

Dr. G. T. CREGAN asked if it was harmful to become accustomed to sleeping in a noisy thoroughfare.

Dr. GORDON LANE said that no one who retained normal sensory faculties lost hearing in sleep. No one from birth to death ever lost all connexion of the soma with the environment. The auditory faculty was the sentinel of the organism. The subconscious mind discriminated between important and unimportant noises, and the unimportant did not affect the sleeper.

If the salt used in mental hospitals were cut down, fewer hypnotics would be needed. The sodium-ion content in the blood was the conducting medium of psychical reflexes; if toxic products poisoned that reflex arc, sleep was lost. No particular drug dealt with sleeplessness. If the sodium content were sufficiently reduced, bromides were effective; otherwise they were not. Pavlov had said that bromide was not a sedative but an excitant to the centre which cut out exhausting stimuli.

Replies.

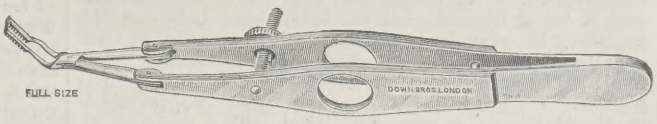
Dr. WILSON, in reply, said that narcoleptic patients went to sleep standing; they did not suffer from atony, for they were not in deep sleep. There were all degrees and kinds of sleep. The question of depth of sleep was important; ten minutes' sleep was not always refreshing and, even if it were, it did not make up for length of sleep. The knee-elbow position of the infant was not, he thought, a reversion to an arboreal type; it probably had something to do with flow of blood to the head, pressure of viscera on venous channels, and getting away from light. To know when a stimulus changed its action on an arc from awakening to narcotising would be a clue to the mystery of sleep. He did not agree that a self-preservative mechanism was necessary in sleep, nor that the brain could reject unimportant sounds as a matter of course. If we could cut out auditory stimuli, especially on busy thoroughfares, our sleep would be much deeper.

Dr. SEYMOUR-PRICE, also in reply, recommended a contrary suggestion, that of keeping awake. Noise was entirely a question of habit; men had often slept through heavy shell-fire. Silence might be more disturbing than accustomed noise.

New Inventions.

A NEW CAPSULE FORCEPS.

ONE is apt to fail in doing a satisfactory capsulectomy from the teeth of the forceps refusing to bite into the capsule, this being specially the case in hypermaturity from toughness of the capsule or fluidity of the cortex. A more vertical inclination of the teeth to the capsule than is possible with the usual pattern of forceps, thus giving a better grip, is obtained by setting the teeth on short primary arms, which in turn are opened and closed by long secondary arms. The latter, as shown in the illustration, are given a ring grip, and provided with a screw stop to limit the distance to which the teeth can separate to a distance not exceeding 3 mm. The heels of the short arms are not only separated to the extent of 1 mm., but are raised 1 mm. above the level of the teeth, so that they cannot possibly grasp the iris.

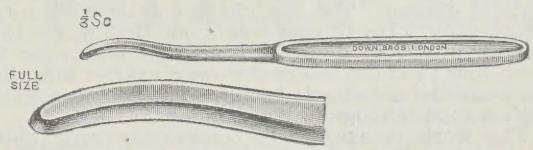


The makers are Messrs. Down Bros., Ltd., 21 and 23, St. Thomas's-street, London, S.E.

G. F. ALEXANDER, M.B., C.M. Edin.

A MODIFIED FORM OF FARABEUF'S RASPATORY.

THE illustration shows a modified form of Farabeuf's raspatory. The standard form of rugine designed by Farabeuf, of Paris, for use on the long bones was found to bring the hand somewhat inconveniently near the work, while the longer rugines designed by Pierpoint and Mitchell are rather heavy for fine work round the orbit, and it is thought that the rugine here referred to will be found convenient for delicate and precise work which falls to the lot of an ophthalmic surgeon. Messrs. Down Bros., Ltd., 21 and 23, St. Thomas's-street, London, S.E., are the makers.



J. N. DUGGAN, F.C.P.S. Bombay, L.M.S., D.O. Oxf.

WEEKLY PAYMENTS FOR MEDICAL SERVICE.—An association has been formed at Stockton-on-Tees, and has already begun work, which provides for the attendance of a family doctor in return for payments ranging from 6*d.* per week for one adult to 9*d.* per week for one adult and three or more dependents. The organisation embraces the boroughs of Stockton and Thornaby, and the neighbouring districts of Billingham, Haverton Hill, Port Clarence, Eaglescliffe and Yarm, and up to the present 22 medical men have joined it. The object of the service is to coördinate the provision on a contract basis of medical attendance and treatment for uninsured persons and the dependents of insured ones.

Reviews and Notices of Books.

THORACIC PUNCTURE FLUIDS.

The Clinical Pathology of Thoracic Puncture Fluids. By S. ROODHOUSE GLOYNE, M.D., D.P.H., Pathologist, City of London Hospital for Diseases of the Heart and Lung. London: John Bale, Sons and Danielsson, Ltd. 1930. Pp. 83. 10*s.* 6*d.*

THERE has long been a demand for a book of this type, and Dr. Gloyne has succeeded in presenting one small in size, clearly written, and containing just the information that the average practitioner requires. The chapters dealing with the anatomy, physiology, and pathology of the pleura are of considerable importance. The lymphatic system is a closed one and a layer of endothelium intervenes between the capillary blood-vessels and the lymph vessels, so that organisms from an infected pleura cannot pass readily through the lymphatics to the mediastinal glands. It is for this reason that suppurative mediastinitis is a rare condition. The method of making an exploratory puncture is explained in detail. The syringe should be sterilised by boiling, and no antiseptics should be used if a bacteriological examination is required. Clotting of the exudate should be prevented by sodium citrate. The importance of a cytological examination is discussed, and the reader is warned that an excess of lymphocytes, although usually indicating a tuberculous infection, does not necessarily do so. The author suggests the term "small round cell" for general use instead of lymphocyte, since the origin of these cells is uncertain. A very full account is given of the means by which tubercle bacilli can be found in some of these effusions. Their detection is largely a matter of careful search; the longer the search the higher the percentage of cases in which the bacilli are found.

In the effusion which follows spontaneous pneumothorax a considerable number of polymorphonuclear cells are generally combined with tubercle bacilli, and this is of importance in diagnosis. A full account of the bacteriology of pleural fluids is given, and the methods of staining are carefully described. An interesting chapter deals with rare types of effusion such as cholesterol, chylous, and fluids found in hydatid disease. The last chapter deals with autoserotherapy. Dr. Gloyne points out that whilst this is always of very doubtful benefit, it may even be dangerous; and the reader is warned against injecting fluid containing tubercle bacilli. The book concludes with a good bibliography and index.

The work is excellently constructed and quite up to date. It should appeal to the busy practitioner who will find in it useful information and clear instructions how to conduct some of the more simple examinations.

PREPUBESCENT SYPHILIS.

By PHILIP C. JEANS, A.B., M.D., Professor of Pediatrics, Iowa University School of Medicine; and JEAN V. COOKE, A.B., M.D., Associate Professor of Pediatrics, Washington University School of Medicine; Supervising Editor, ROYAL STORRS HAYNES, Ph.B., M.D., Clinical Professor of Diseases of Children, College of Physicians and Surgeons, New York City. London: D. Appleton and Co. 1930. Pp. 295.

THIS book is one of a series of volumes issued under the general title of Clinical Pediatrics, of which Prof. Royal Storrs Haynes, of Columbia University, is supervising editor. The analytical record here supplied of the authors' experience of more than 1500 cases of syphilis in children observed during a period of 16 years will be widely appreciated. This is a considerably larger group of cases of inherited syphilis than any yet reported, and it is noteworthy, though this was to be expected, that the incidence is at least two and a half times as great amongst coloured as amongst white infants. The book opens with an interesting chapter, containing excellent portraits of outstanding syphilologists, on the history of syphilis—particularly of hereditary syphilis. The brilliant investigations of Ehrlich and Hata in the domain of chemotherapy hardly receive adequate recognition in the statement that "after many fruitless trials Ehrlich at last hit upon what we now know as arsphenamin." Chapters on the ætiology and pathology of syphilis, with special reference to the laboratory examination of the blood and cerebro-spinal fluid, give sufficient information without going too deeply into technicalities. The upper limit of the normal cell content of the fluid is given at ten per c.mm. This is at least double the figure usually accepted in this country, though admittedly one may occasionally come across a cerebro-spinal fluid with a cell count of ten per c.mm., and with no other abnormal feature. The chapters on the transmission of syphilis by inheritance and the familial effects of syphilis, with the social aspects, are full of interest, and that dealing with the social aspects stresses the damage done to families by syphilis and its great cost to the State. The clinical description of the early and late manifestations of the disease are well given, and the large amount of material upon which the authors base their analyses gives weight to their percentage occurrence of symptoms. It is curious that they had only two cases of paroxysmal hæmoglobinuria amongst their series of over one thousand cases of congenital syphilis. We find no references in this book to the eczema oris described by Leonard Findlay, to the syndrome of Hennebert (nystagmus and giddiness on applying pressure to the external auditory meatus), or the possible effects of congenital syphilis upon the endocrine glands. The chapter on neurosyphilis is particularly valuable; the high incidence of congenital neurosyphilis is not sufficiently appreciated. Table XXVIII. is difficult to follow. The chapters on diagnosis, prognosis, and treatment are very good, but it would have been a convenience to British practitioners if the European equivalents of the "arsphenamin" products had been added in the text or a footnote. The bismuth preparations bistovol, bismuth-oxychloride, are also omitted, and even the names (salvarsan and neo-salvarsan) originally given by Ehrlich to the preparations "606" and "914" are nowhere to be found in the volume.

The book is well printed and produced and fully illustrated, though some of the illustrations of the skin lesions are not very informative. A few coloured illustrations would have still further enhanced the value of the book, which is a most useful addition to the literature of inherited syphilis.

DISEASES OF THE EAR.

Fourth edition. By PHILIP D. KERRISON, M.D., Consulting Aural Surgeon to the Manhattan Eye and Ear Hospital. London: J. B. Lippincott Company. 1930. Pp. 627. 35*s.*

THE fourth edition of this admirable text-book contains few additions or alterations, compared with the third edition which appeared seven years ago. New matter includes a description of Sir Charles Ballance's work on the treatment of facial paralysis by anastomosis of the facial and glosso-pharyngeal nerves. Dr. Kerrison also now provides a fuller account of the various surgical measures which have been proposed for the treatment of otitic purulent meningitis. These methods include repeated lumbar puncture, dural puncture, through-and-through cerebro-spinal lavage, and drainage of the cisternal magna. Dr. Kerrison believes that none of these methods increases the patient's chances of recovery, and that most of them add to the danger of spreading the infection; he prefers free exposure of middle and posterior fossæ from the mastoid area, with incision of the dura if under tension, and, if labyrinthitis is present, drainage by simple removal of the

promontory. We would suggest, for a future edition, a more systematic description of the characteristics of the normal cerebro-spinal fluid, and of its modifications in various forms of meningitis and in other diseases. A new chapter has been added which deals in a sympathetic manner with the training of the totally deaf child; it is not stated at what age systematic education should be begun.

As we noted when reviewing the third edition, this book is a model of what a text-book should be, for it contains a careful and thorough description of examination methods, providing elementary knowledge which the student should and the practitioner must possess, and gives details about the more obscure conditions which the specialist requires.

Surgical Treatment in Tuberculosis.

Traitement médico-chirurgical des pleurésies purulentes tuberculeuses. By F. Dumarest, M. Guilleminet, and P. Rougy. Paris: G. Doin et Cie. 1930. Pp. 42. Fr.16.

Until recently surgical intervention was almost the only thing *not* to advise in a case of tuberculous empyema. It is now recognised, however, that the best results are obtained by collaboration between the surgeon and the physician. In this book the authors make the following annotated classification: 1. Cold abscess of pleural cavity with or without pneumothorax. In this condition the general health of the patient remains good and the treatment consists in occasional aspirations. 2. Tuberculous empyema associated with pyrexia and malaise. Here the essential treatment is pleural lavage. 3. Septic tuberculous effusion. In this type secondary infection has occurred, and there is often a pulmonary or parietal fistula. Intercostal drainage is often the best treatment, and a subsequent thoracoplasty may be necessary. The technique of the various operations mentioned are briefly described and the X ray plates are well produced.

The book gives a concise account of the modern treatment of tuberculous empyema and forms a useful addition to the literature on the subject.

Internal Diseases.

The George Blumer Edition of Billings-Forchheimer's Therapeusis of Internal Diseases. Supplement. Edited by George Blumer, M.A. Yale, M.D., David P. Smith Clinical Professor of Medicine, Yale University School of Medicine. London: D. Appleton and Company. 1929. Pp. 760. 30*s*.

Dr. Blumer has in this volume brought up to date his edition of the Billings-Forchheimer's Therapeusis which was first published in 1924. The contributors have now added such supplementary material and corroborative data as the progress of the past few years has made necessary. The result is a striking commentary on recent advances in therapeutics, even though the authors as a whole have not found much occasion to modify their articles of 1924. For the most part the chapters in this book are self-contained and the reader will find no call to refer back to the original text of 1924; a few, however, are essentially supplementary. The subject matter of the articles here collected range from such matters as the surgical treatment of angina pectoris and of diseases of the heart and pericardium to the problems of serum therapy and vaccination. George Minot contributes an authoritative paper on the treatment of pernicious anæmia, in which he urges that the best results will be obtained when large doses of the liver substance are prescribed rather than small doses "sufficient to create pronounced improvement and permit a continued fairly satisfactory sense of well-being," and that additional amounts should be given in the presence of associated infections. In other types of anæmia he suggests trial for a period of weeks of a régime of liver and iron with a proper supply of other foods. A valuable list of references is included in this contribution. D. Marine contributes a concise account of the views of American workers upon the use of iodine in the treatment of thyroid diseases; for exophthalmic goitre he suggests that small doses may be continued "for one or three months," whilst large doses should only be used in those cases which are to be operated upon within two weeks after its administration is begun; no comment is made upon the prolonged usage of large doses which has recently been advocated. Other chapters of interest to the general physician are those dealing with quinidine, novarsurol in cardiac œdema (a note on its dangers in renal cases is included), protein shock therapy, malarial treatment of general paralysis, and the treatment of heart disease. There is little new to be found in the articles on the treatment of nephritis or of cirrhosis of the liver. Insulin therapy is adequately dealt with, but little mention is made of its applications in non-diabetic conditions. The plan of treatment of obesity described in some detail by Burgess Gordon is one that has as yet hardly received sufficient confirmation; its main feature lies in the reduction of potatoes and all foods derived from grains and the administration *between meals* of divided doses of dextrose. Collapse therapy in pulmonary tuberculosis is discussed in considerable detail (W. B. Soper), as are the various branches of serum therapy, particularly the specific treatment of lobar pneumonia.

On the whole the attitude of the authors has been a properly critical one, and all who wish for a concise summary of recent advances in the main branches of internal medicine would be well advised to read this volume. The illustrations are numerous and excellent and the lists of references at the end of each chapter are valuable.

Nursing and Diseases of Sick Children.

By Various Authors. Edited by Alan Moncrieff, M.D., M.R.C.P., Medical Registrar and Pathologist, Hospital for Sick Children, Great Ormond-street. London: H. K. Lewis and Co., Ltd. 1930. Pp. 580. 15*s*.

Diseases of Children for Nurses. Sixth edition. By Robert S. McCombs, M.D., Children's Hospital of Philadelphia. London: W. B. Saunders Co., Ltd. Pp. 594. 12*s*. 6*d*.

The additions which have been made to the nurse's curriculum during recent years have been a matter of general, if not always of favourable, comment. But even those medical men who regard detailed knowledge of medicine and surgery as unnecessary for nurses will welcome books, such as these, which will facilitate the acquisition of knowledge now required by statute. No more eloquent testimony to the high professional level at which nurses are expected to aim on both sides of the Atlantic could be found than the issue of these books.

The first of them is new, and has been compiled by Dr. Alan Moncrieff with due regard for the syllabus of the examination for the Supplementary Part of the Register for Sick Children's Nurses. Following this syllabus, the work includes sections on nursing, and on both medical and surgical diseases of children. The subject matter has been admirably handled, and has yielded a volume which is well representative of the great pædiatric training centre from which it comes. The principal collaborators are Miss M. A. Fussell, Sister Tutor of the hospital, Mr. Twistington Higgins, Mr. Eric Lloyd, Dr. B. E. Schlesinger, and the Editor; Mr. P. G. Doyne has contributed a chapter on diseases of the eye. A useful feature is an appendix containing essential facts about drugs in common use. This book will be valuable to candidates for the General Nursing Council examination, and may be recommended to members of the nursing

profession engaged in private practice who have had no special training in diseases of children. There are few omissions of any importance, but in a future edition the nursing of infections of the frontal and ethmoid sinuses should be discussed.

Dr. McCombs's text-book has reached its present level by a process of successful evolution, having passed through six editions since its original publication in 1907. The new edition has been enlarged and brought thoroughly up to date. This book is devoted exclusively to medical diseases, the account of the nursing of each disorder following the clinical descriptions. The style of the text is simple and lucid, and the information accurate. Among the best features of the book are the illustrations, which include a number of colour plates.

LONDON HOSPITAL PAPERS.

Researches Published from the Wards and Laboratories of the London Hospital during 1929. London: H. K. Lewis and Co., Ltd. 7*s.* 6*d.*

THIS volume contains 48 original papers selected from the published communications of London Hospital authors during the year 1929. A great variety of subjects are treated. Mr. Hugh Cairns has two papers on the subjects of intracranial tumours and head injuries. Dr. Donald Hunter writes on hyperparathyroidism and Dr. O. Leyton on the administration of insulin in suspension. In addition to the articles of surgical, medical, neurological, and histological interest, the volume contains a series of four papers on the filtrable viruses by Dr. S. P. Bedson and Dr. J. O. W. Bland, two on the tetanus bacillus by Dr. Paul Fildes, and a large number of important biochemical papers by Dr. John Marrack, Mr. F. L. Hewitt, Mr. H. D. Kay, Dr. Campbell Smith, and others. The consistently high standard of the contributions here collected, together with the wide and important field of medical subjects concerned, makes the collected work of interest not only to members of the London Hospital but also to all students and teachers who are occupied in promoting the advance of medicine. The book is, moreover, a tribute to the scientific vigour of the medical school from which it comes.

RECENT ADVANCES IN PLANT PHYSIOLOGY.

By E. C. BARTON-WRIGHT, M.Sc. Lond., Lecturer in Botany in the University of London, King's College. London: J. and A. Churchill. 1930. Pp. 352. 12*s.* 6*d.*

THE compiler of a volume dealing with recent advances in any branch of science is confronted with the difficulty of selection; Mr. Barton-Wright admits that he has been guided entirely by his own predilections in deciding what is important work, and on the whole we do not cavil at his choice. He has divided his subject matter into six chapters, dealing respectively with the soil and water relations of the plant, transpiration, translocation and root pressure, carbon assimilation, nitrogen metabolism, respiration, and the physiology of growth. In the first chapter he gives a somewhat brief review of the much debated question of soil acidity and also of the base exchange, while the investigations of Weaver in America on the ecological and physiological characters of different root systems receive fairly extensive consideration. In the second chapter will be found a useful account of the question of the mechanism of the ascent of cell sap with a criticism of Bose's vital theory of pulsatory activity which should help to clarify ideas about Bose's rather sensational deductions. The same chapter also contains an account of the subject of translocation, including the work of Mason and Maskell in Trinidad on the cotton plant. The chapter on carbon assimilation is perhaps the least satisfactory of the six, containing on the whole little information that cannot equally well be found in most of the more recent text-books. In the chapter dealing with respiration the student should be grateful to the author for an account of the researches of Blackman and Parija which in the original are rather difficult to disentangle. The last chapter covers a large field, and includes a consideration of much recent and widely scattered literature which has not yet entered the text-books. Though his enthusiasm has at times led Mr. Barton-Wright to criticise the work of others in a manner which does not seem justified, he has produced a useful book obviously founded on extensive reading.

THE BRIDLE OF PEGASUS.

By WARREN R. DAWSON, F.R.S.E. London: Methuen and Co., Ltd. 1930. Pp. 203. 7*s.* 6*d.*

THIS book, dedicated to the learned author of "The Golden Bough," is addressed equally to the medical profession and to the public. The studies of magic, mythology, and folk lore are well selected in subject and well set down, while a profuse bibliography shows the author to be widely read. As a result he has been able to bring together some interesting tales illustrating popular beliefs whose history reaches back to primitive times, and whose precepts are even yet rooted in the minds of the more uneducated and simple of all populations. The volume is made up of eight separate and independent studies, but the different essays have this in common, that they reveal certain efforts of primitive man to control the forces of nature by magical aid. A word of praise should be added for the scrupulously careful way in which the full references are given.

NOTABLE BRITISH TRIALS.

Trial of George Chapman. Edited by HARGRAVE L. ADAM. London: W. Hodge and Co. 1930. Pp. 223. 10*s.* 6*d.*

George Chapman, alias Severin Klosowski, hanged in 1903 for the murder of Maud Marsh, forms the subject of the fiftieth volume in Messrs. Hodge's Notable British Trials Series. Dr. Thomas Stevenson, the Home Office expert, was called to prove that Maud Marsh died of antimony poisoning. His evidence of the similar deaths of Mrs. Spink in 1897, and Bessie Taylor in 1901 (with each of whom Chapman had lived), was admitted for the purpose of negativing any suggestion of accident in the Marsh case. Up to a point Chapman was fortunate in his victims' medical attendants; Mrs. Spink's death was attributed to phthisis, and Bessie Taylor's to "exhaustion from vomiting and diarrhœa" with no suspicion of foul play. The uninquisitive attitude of the doctors was criticised by Mr. Justice Grantham, whose characteristic summing-up (delivered in days before the Court of Criminal Appeal was established) almost took the guilt of the accused for granted. Mr. Hargrave Adam's adequate, if sometimes diffuse, introduction mentions the possibility that Chapman was identical with Jack the Ripper. The main ground for their suggestion is Chapman's presence in London, and indeed in Whitechapel, during the period of the Ripper murders; similar murders are said to have occurred subsequently in Jersey City at a time when Chapman was in that part of America, and to have ceased when Chapman returned to England. This argument from opportunity will probably not convince those who hesitate to identify an antimony poisoner with the madman who had mutilated a number of unfortunate women ten years earlier. If the letter and card received by the police in 1888 were the authentic writing of the Ripper, could the writer have been Chapman, who in 1903, was unmistakably illiterate? Officials like Sir Melville Macnaghten have, as Mr. Adam says, claimed to have penetrated the Ripper mystery. But they leave us no wiser. A constable had a chance to catch the murderer red-handed on one occasion, but turned violently sick at the ghastly sight of the corpse and so the Ripper got away.

THE LANCET.

LONDON: SATURDAY, MAY 24, 1930.

REGIONAL HOSPITAL ORGANISATION.

THE Merseyside Hospitals Council, which organised and administers the contributory fund for the Liverpool hospitals, has issued a memorandum upon a subject which cannot fail at an early date to engage the serious attention of every person concerned with hospital policy. It deals with the organisation of hospital services in south-west Lancashire, Cheshire, and North Wales, and has been called forth by the heavy demands now made upon the Liverpool hospitals, and especially the teaching hospitals, from districts outside the scope of the fund. Patients from those districts, which include the Isle of Man, last year cost the Liverpool medical institutions a net sum exceeding £16,000, after allowing for contributions by them or on their behalf and subscriptions known to have been received from their areas. That is to say, the Merseyside contributors are paying part of the cost of hospital treatment and maintenance of "foreigners" in much the same economic condition as themselves. This, in itself, is a serious situation, but the financial is really less grave than the medical aspect of the matter. The swamping of beds results in the creation of waiting-lists which would otherwise be of comparatively small proportions. The Liverpool beds would be inadequate in any event, but this pressure from areas distant more than ten miles from Liverpool town hall intensifies congestion without bringing compensation. The unfairness of the burden is obvious; the difficulty is how best to remove it. It is essential to bear in mind that the object of the Liverpool penny-in-the-pound fund, like all other contributory schemes, is not merely to improve finance, but to increase the medical efficiency of the hospitals. To ban the "outsider" is clearly unthinkable. The smaller centres cannot possibly provide the resources either of personnel or equipment of a large town which is the seat of a medical school; the avenues of access to these advantages must therefore be kept open to the whole of the region which looks to a particular hospital centre.

In the opinion of the Merseyside hospital council the only way out of the difficulty is the establishment of contributory schemes similar to its own in suitable centres of the outer zone. This need not be a very elaborate process, since four such schemes ought to suffice—West Lancashire, centring on St. Helens, Widnes, or Runcorn; Deeside, centring on Chester; north-east and north-west Wales, centring the one upon Wrexham and the other upon Bangor. These regional councils might be federated, or affiliated, with the Merseyside council, and in dealing with their finances they would necessarily take into account not only the cost of maintaining the patients they sent to Liverpool, but the overhead costs of the teaching hospitals. This, however, is to solve only a part of a problem which will rapidly grow more insistent. How can the best use be made of the hospital services, of varying importance, which already exist in these outside areas? If the Liverpool hospitals can do what even the larger local ones cannot do, the smaller ones, in their turn, are dependent for special services upon the more central institutions of the district. Those institutions would form the natural core of a regional system which would always have a head-centre to which it could turn when the highest skill or special equipment was necessary. To work successfully such a system would need a measure of elasticity which there is no need to suppose would be lacking. The existing haphazard and unsystematic state of things is always wasteful and sometimes dangerous. Either the costly equipment of a local metropolitan hospital is used for cases which do not require it, or its employment may be perilously delayed in cases in which it is essential.

Results of practical importance to national hospital policy may be expected to follow the issue of this memorandum, which is intended to form the basis of discussion at a series of conferences to be convened by the Merseyside Hospitals Council. The difficulties which are being so keenly felt at Liverpool are likely to be, if they are not already being, felt in other great centres. It would seem that the contributory scheme bids fair to be the financial basis of the voluntary hospital service for a long time to come, in the absence of revolutionary changes of which there is at present no sign. Wherever these schemes have been established they have not only succeeded, but succeeded in a measure and with a rapidity that has been startling. Sheffield and Birmingham, Leeds and Liverpool, to mention only some outstanding instances, to which the Hospital Saving Association in London may be added, are raising much of their hospital revenue from the pence of the artisan. But the benefits of these pence are everywhere being claimed—and enjoyed—by those who do not subscribe them, and there are large areas, even in the industrial north and midlands, where there are no contributory schemes. Sometimes, too, there are large, but not teaching, general hospitals just outside the area of a scheme which are yet not infrequently beholden to it. Sometimes, moreover, it has been complained that a contributory scheme has invaded territory which believes that, with its own excellent hospital, it is sufficient to itself. Regional coördination of contributory schemes will rapidly become imperative if they are not to be left suspended in mid-air. The delimitation of boundaries will not only be for the advantage of existing schemes but will be likely to encourage the formation of others. This step is, indeed, a necessary part of that systematising of the voluntary hospital service which has been imposed upon it by recent events. The existence of a highly organised municipal service side by side with a casual and unsystematised voluntary service would involve perils which grow in gravity the more closely they are looked at.

THE FUNCTION OF THE AUTONOMIC SYSTEM.

THE function and arrangement of the autonomic system used to be one of those branches of knowledge which the medical student was at liberty to forget as soon as he had passed his preclinical examinations. The system was known to play an important part in the internal economy of the body, but disorders of the autonomic nerves seemed so rare or the symptoms of them were so obscure that little interest was taken in them even by neurologists. The position has certainly altered to-day. It is true that it needs a bold man to diagnose vagotonia, that the surgery of the sympathetic is still in the experimental stage, and that the hypothalamus is still regarded as a region

of the brain best left alone; but there is no doubt that disorders of the autonomic system do exist and that they may become amenable to treatment.

Prof. CANNON'S Linacre lecture at Cambridge gives an account of the autonomic system which differs strikingly from much that has been written on the subject. It is an authoritative statement based on experimental work in which a high standard of accuracy has been required, and it gives a clear picture of the work which is normally carried out by the autonomic nerves and of the results which follow from their removal. In his discussion of the double nerve-supply of the viscera, Prof. CANNON draws an interesting contrast between the cranial and sacral, or parasympathetic, systems and the opposing sympathetic. He points out that the cranial and sacral nerves are arranged to produce a number of distinct and independent reactions—e.g., constriction of the pupil, salivary flow, slowing of the heart—whereas the sympathetic, with its overlapping connexions, gives a general diffuse activity in the opposite sense over a very wide area. By the simultaneous action of the two systems any special viscus can be separately affected in either direction, but the diffuse action of the sympathetic ensures a widespread discharge when the stability of the organism is threatened. This function of preserving the "homeostasis" of the body—i.e., of preserving a constant internal environment in spite of the activities of the animal and of its surroundings—is the main concern of the sympathetic system, aided by the discharge of adrenalin which accompanies sympathetic activity. By regulating the peripheral vessels and the sweat glands, the system helps to preserve a constant internal temperature, it causes a discharge of sugar from the liver and of red blood corpuscles from the spleen, if either are needed to increase the capacity for muscular exertion, and in face of injury it checks the bleeding and prevents any reduction in the flow of blood through the heart and brain. There are, of course, many other systems concerned in maintaining the internal environment, but a nervous mechanism occupies a peculiar position in that it is linked to the brain and so can be brought into play when danger threatens, but before the actual moment for combat or flight has arrived.

The total removal of the sympathetic system naturally reduces the efficiency of the animal, but the remarkable fact brought out by Prof. CANNON'S experiments is that the reduction becomes a serious matter only when extreme conditions have to be faced. When animals are totally sympathectomised they become exhausted more rapidly by severe muscular work, because the vascular system is no longer adjusted to meet the increased demand. Sugar is no longer liberated from the liver during emotional excitement and the spleen fails to contribute its reserve of erythrocytes. But with all this the animals are able to live comfortably in the sheltered conditions of a laboratory. There is a negligible change in the basal metabolism and unilateral sympathectomy produces no change in the rate of growth, in the muscular tone, or in the resistance to fatigue on the affected side of the body. No doubt some of these negative results will not go unchallenged, but the fact remains that the sympathetic seems to play a relatively unimportant part as long as the animal lives under conditions "where there are no marked temperature changes throughout the year, no necessity of struggle for food, no requirement of escape from enemies, and no danger of hæmorrhage." As Prof. CANNON points out, this is a very special and limited sort of existence for an animal, and it would be a mistake to belittle the importance of the sympathetic for the proper functioning of the body. But man has so much control of his external environment that his life is more like that of a laboratory animal than of one set free to look after itself in the open. We regulate our body temperature by clothing ourselves and heating our rooms; many of us have no need to undertake exhausting muscular work, and the struggle for food is a mental rather than a physical struggle. The sympathetic system is clearly not as essential to our well-being as it would be to that of a wild beast. Parts of it have now been removed in man for the relief of various disorders ranging from spasticity of the muscles to angina pectoris. The theoretical basis for many of these operations has been extremely uncertain and the results are difficult to assess, but at least it seems to be true that very little harm has come from the excision of sympathetic ganglia except in some of the operations for angina. Intractable pains have undoubtedly been relieved, and a more exact knowledge of the nervous pathways may increase the percentage of successes, though it may reduce the number of cases in which an operation seems advisable. In any event, the possibility of surgical interference with the sympathetic system has opened up a new line of attack on various disorders of blood-vessels and viscera, and if an animal can lead a comfortable though restricted life after the loss of its entire sympathetic we need not be horrified at the thought of its partial removal in man.

SANATORIUM AND AFTER.

TUBERCULOSIS illustrates, as nothing else in medicine, the operation of social circumstances. There are at the present time some 15,200 beds provided in England and Wales for the sanatorium treatment of pulmonary tubercle, the value of which in improving the general health is now beyond dispute, although many of the patients on leaving the sanatorium are still unfit to go back to work at their old occupations. This must account for the tendency, particularly noticeable last year,[1] to increase the duration of residence beyond the usual period of six months. In America at least one half of ex-sanatorium patients are reabsorbed at once into ordinary industry, but the proportion is certainly not so large in this country and is probably nearer 40 than 50 per cent. It depends largely on the operation of social circumstances. In times of industrial depression it is well-nigh impossible to find openings for ex-consumptives, but the qualms about taking them on again are subdued in times of industrial prosperity. Re-entry of such a worker into the industrial market postulates a high degree of intellectual capacity at some particular job, for he no longer possesses the essential requirement of an unskilled labourer which is a high standard of physical fitness. The position challenges all who are concerned with after-care to raise by every means the percentage of those whose skill entitles them to be reabsorbed into industry. The scheme for technical education of suitable youths between the ages of 14 and 19 undertaken by the National Association for the Prevention of Tuberculosis under the supervision of the Surrey Education Committee is one useful step in this direction. Taken by and large there is, however, little hope economically for the consumptive unless he is able to resume his previous occupation.

[1] See Ministry of Health Memorandum, 131 b/T.

But what of the remainder? There are, as the Employment Committee of the Joint Tuberculosis Council indicates,[2] three other channels into which the consumptive may be steered in attempting to land him on economic ground. He may be employed under an authority, State-aided or voluntary, in some sheltered position; he may be allowed to work at an urban or municipal workshop; or he may be admitted to one or other of the village settlements specially designed to meet his requirements, medical and economical. Some local authorities, such as those in Hull, Liverpool, London, and Walsall, have turned their attention to the employment of ex-sanatorium patients on the staff and if, as we may now hope, the problem of after-care is vested as a rule in a definite committee, more steady progress may be hoped for in this direction. But the employment of ex-patients on the staff of sanatoriums is a practical proposition already proved; its scope is large, for the total value of staff services rendered in such institutions must amount to at least £550,000 a year. The majority of medical superintendents are in favour of the employment of ex-patients except in the preparation of food, and there are probably over 450 now occupied as nurses, domestics, porters, gardeners, and the like. Few practical difficulties have arisen, and a margin of 10 per cent. of staff is suggested as sufficient to meet the expected breakdowns. The subsidy, whether in labour or money, does not seem to be greater for patients working on the sanatorium staff than for those in workshops attached to settlements. Employment is given only on the distinct understanding that its object is to restore the patient to health and working capacity, and if these posts are reserved for those actually suffering from tuberculosis, and not simply for those who have been diagnosed as such or who have had tuberculosis at some previous period in their history, a wide channel is opened for rehabilitation. After finding so large a use made of so small an industry it is somewhat of a shock to learn that the total number of tuberculous employees engaged in urban workshops in this country probably does not exceed 90 at the present time. Medical results have been satisfactory enough at the Leeds factory-in-the-fields and at the Spero workshops in London, although naturally none of the workshops has been self-supporting. At Leeds it has cost the corporation about £1 a week for every man so employed—care committees have often spent on individual cases much more than this sum without any real economic advantage—but the experience has been too small to decide what subsidy is necessary for workers in such schemes.

Employment in village settlements, the remaining channel to consider, has, in the Committee's opinion, passed from the experimental stage and may be discussed in the light of its contribution to the problem of tuberculosis. The criticism of needlessly high expense comes badly from any local authority which has been relieved by the existence of the settlement from statutory responsibility for an infective individual, and which actually gains by having the house of the sufferer free for a healthy member of the community. Although at Preston Hall the capital expenditure per settler to date is over £500, this is regarded as an outside figure; in any case, money should be forthcoming from rates and taxes for this as for any other branch of the tuberculosis scheme. More cogent is the criticism that the settlement caters only for the few. During the first ten years at Papworth fewer than 7 per cent. of the cases treated were admitted to the settlement, and at Preston Hall during 1925–28 the proportion was a bare 14 per cent. The total number of ex-patients employed in village settlement industries in this country is now only about 340, whereas, if the settlement scheme is to meet all needs, for every sanatorium of 150 beds there should be an absorption rate of 9 patients per month (which would mean at the moment a total of 900) into settlement conditions, a result, the committee remarks, beyond the wildest dreams of the most optimistic. The success of a settlement depends on factors met with but rarely in the realm of medicine and economics. Settlements run on Papworth lines must depend for prosperity on a turnover which is secured in spite of giving to a number of sub-standard individuals the security of tenure denied to healthy workmen in prosperous concerns outside. In view of fluctuating markets, Preston Hall would hesitate to take the risk of indefinite enlargement, and it is probably true that large settlements on similar lines could not be repeated in more industrialised counties, were patients to be drawn solely from surrounding areas with a particular type of technical ability. If the settlement idea is to extend, as it should, each separate unit must grow from a small nucleus, the centre of which will be a scheme for occupational therapy. Places should be reserved for the type of case who would not ordinarily be absorbed into industry in the outside world; the settlement must not come to be a refuge for substandard labour but remain part of the mechanism for continued treatment. Key-men might be allowed to remain on after they could safely find for themselves outside, but it is strictly as a community for restoration to health and working capacity that the village settlement approaches to the perfect solution of the medical and economical problems of the consumptive. Further development might well be in the direction of forming a national association of village settlements as set out on p. 1143 by Dr. VARRIER-JONES of whose pioneer work at Bourne, Cambridgeshire, the modern conception of these settlements is the outcome. Preston Hall and Papworth represent the end-results of that unique experiment, for Dr. VARRIER-JONES took charge of Preston Hall when the British Legion assumed responsibilities there in 1925 and was succeeded in 1927 by Dr. MCDOUGALL to whom the report owes its present form.

[2] Report of the Employment Committee of the Joint Tuberculosis Council on Care and After-care Schemes in Tuberculosis. Signed by Dr. Jane Walker, Dr. D. P. Sutherland, Dr. H. Vallow, Dr. G. Jessel, Dr. P. W. Edwards, Dr. C. O. Hawthorne, and Dr. J. B. McDougall, the last-named being convener of the Committee. May, 1930. 1s. 6d., post free, from the Secretary, Preston Hall, Aylesford, Kent.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Demonstrations will be given at the Miller General Hospital, Greenwich, at 2 P.M. on Monday, May 26th, by Dr. E. C. Warner (selected cases, children), and on Friday, the 30th, by Mr. Arthur Gray (gynæcological operations). Lectures suitable for M.R.C.P. candidates will be given by Dr. B. T. Parsons-Smith, at 11, Chandos-street, W., at 8.30 P.M. on Tuesday, May 27th (Coronary Thrombosis), and on Friday, the 30th (Cardiac Failure). Two courses will be held from May 26th to June 7th—a morning course on Diseases of Children at the Hospital for Sick Children, Great Ormond-street; and an all-day course in Medicine, Surgery, and the Specialties, with special reference to tuberculosis, at the Queen Mary's Hospital, Stratford. Courses in June will be as follows: Gynæcology, at Chelsea Hospital for Women (June 16th to 28th); Dermatology, at the Blackfriars Skin Hospital (16th to 28th, afternoons); Medicine and Surgery, at the Prince of Wales's Hospital (16th to 28th, all day); Proctology, at St. Mark's Hospital (June 30th to July 5th, all day). Copies of all syllabuses and particulars of post-graduate work are obtainable from the Secretary of the Fellowship at 1, Wimpole-street, London, W.1.

Annotations.

"Ne quid nimis."

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.

THE Royal College of Physicians of Edinburgh was founded in 1681, and it has been decided to celebrate the 250th anniversary of its foundation on St. Andrew's Day, Nov. 30th, 1931. An attempt to incorporate the practitioners of medicine in Scotland for the purpose of raising the standard "both of the character and acquirements of physicians" originated in 1617, when application was made to King James I. of England and VI. of Scotland for that purpose. The King issued an order to Parliament for the establishment of a college to fulfil the design indicated, but political and religious dissensions prevented the scheme from being carried out. A further attempt was made in 1630, when King Charles I. referred the matter to the Privy Council, but the unsettled state of the country again delayed the project. With Cromwell in power accomplishment took a stride further, for the Protector took up the matter warmly, and a patent was made out in 1656 instituting a College of Physicians of Edinburgh. The patent, however, gave powers to the proposed college, which did not meet with general acceptance among doctors, and Cromwell's death put a stop for a time to the proposals. Eventually a charter of incorporation was obtained, chiefly through the exertions of Sir Robert Sibbald and the Earl of Perth, and the Great Seal was appended to the Charter on St. Andrew's Day, 1681, when King Charles II. was on the throne. The first president of the College was Archibald Stevensone. Owing to the destruction of the early minutes of the College the exact scene of the original meetings of the corporation is in doubt, though it may have been the house of Sir Robert Sibbald, the virtual founder of the College and its President in 1684. In 1698 the College resolved to purchase a house, but the members continued to meet in apartments rented for the purpose until 1704. In this year a property was bought in Fountain Close, and seven years later some adjacent land was added, by which time, we learn from contemporary writing, "the grounds and the shrubbery were the envy of the neighbouring Peers, to several of whom the privilege at their request was granted to walk in them as a favour." The buildings erected, however, were not worthy of their environment, and plans for their improvement did not find favour, so that a request was made by the College to the Royal Infirmary for permission to hold meetings at the institution, as well as shelter for the books which were suffering injury. For 15 years the College enjoyed the hospitality of the Infirmary with whose origins it was closely concerned, and the premises in Fountain Court were sold in 1770 for £800. A College Hall was commenced in George Street in 1775, when the foundation-stone was laid by the famous William Cullen, the President. The present hall, designed by Thomas Hamilton, dates from 1844, the adjoining premises having been added at different times. The story of the College, especially in its various connexions with the Royal Infirmary, illustrates the progress of academic and clinical medicine in Edinburgh from the union of the two kingdoms, and there is no need to point to the fact that the science of the senior partner has been repeatedly reinforced from Scotland.

THE SILICOSIS BILL.

THE objects of the Workmen's Compensation (Silicosis) Bill, which has now been read a third time in the House of Lords, are first to bring cases of asbestosis within the scope of Section 47 of the Workmen's Compensation Act, 1925, and secondly to give powers to the Secretary of State to make a general scheme for all the industries to which compensation schemes apply, in order that the medical arrangements may be orderly and efficient. At present such cases are reported by certifying surgeons with medical referees to fall back on in case of disagreement; examination by a medical board, devoting itself entirely to this type of case, will no doubt replace this system. Amendments brought forward by Viscount Brentford at the committee stage of the Bill to each of these proposals were rejected. In the first place, it was suggested that the amount and severity of asbestosis did not warrant its inclusion in the schedule, and that if included there would be an increasing number of claims, many of them without justification. In reply, Earl Russell showed that although the number of workers in asbestos was not large, yet the incidence of disease in them was considerable; more careful and skilled examination of the workers would, he suggested, unmask the presence of asbestosis which had previously been mistaken for some other pulmonary disease. Lord Brentford also expressed anxiety lest the scheme for coördinating medical arrangements should involve a large staff and expenses, of which the major part would fall on the employers who already made their contribution through the national health insurance system. Earl Russell was able to assure him that the Treasury would make an annual contribution to medical expenses, while the national Exchequer would be relieved of the present expense of appeals from the certifying surgeon. Furthermore, existing medical boards for the various silicosis industries would be the basis of the new medical service, and would no doubt be able to cope with the extra work with the addition of one or two new centres. The amendment was not pressed on the understanding that the scheme should be prepared in consultation with the employers' federation.

CERVICITIS AND BACKACHE.

OF the disabilities that cause a person to seek medical aid, backache is one of the most common. The symptoms vary from a heavy dragging sensation which makes life burdensome to an acute stabbing, crippling pain which makes any form of work impossible. The causes of backache are legion; Prof. J. P. Maxwell,[1] of Peking, has recently added to the long list by suggesting that a mild form of osteomalacia might be responsible for some of the cases in this country. The treatment of the condition is usually empirical, and ranges from a mustard plaster or some liniment through belts, extraction of teeth, dietetics and diathermy, and manipulation to a severe surgical operation. All these procedures are praised by their several exponents, but none has received general favour. Dr. James Young[2] has recently restated and emphasised the view that chronic cervicitis is responsible not only for leucorrhœa, but also for abdominal and pelvic pain, bladder and menstrual troubles, and marked and varied disturbances of the general health. Indeed, he goes so far as to say that, with the possible exception of prolapsus uteri, chronic cervicitis is the commonest gynæcological cause of abdominal and pelvic pain, and advises dilatation of the cervix and the cautery in its treatment. Dr. Harold Baker,[3] writing on the same subject in America a few weeks later, while guardedly stating that these symptoms had been attributed to cervicitis, claims that the leucorrhœa may be cured by cautery without dilating the cervix and without any anæsthetic, "since patients experience very little discomfort or pain." That gonorrhœal cervicitis should be promptly and energetically treated, and that gonorrhœal arthritis may be rapidly relieved by treating the cervix, nobody will deny, but that the symptoms suggested by Dr. Young are actually

[1] Proc. Roy. Soc. Med., March, 1930, p. 639.
[2] See THE LANCET, March 15th, p. 575.
[3] Amer. Jour. Obst. and Gyn., April, 1930, p. 548.

caused by, not merely associated with, cervicitis is difficult to believe. The cervix is practically insensitive, and large numbers of women suffering from leucorrhœa complain neither of abdominal nor of pelvic pain. All authorities are agreed that the condition is more common in women who have borne children, and that it is associated with constipation, anæmia, and general ill-health. It is equally well known that women who are run down from any cause, social or industrial, suffer from menstrual disorders and leucorrhœa, and that these symptoms disappear when the general health improves. Many authorities hold that a loaded colon is the commonest cause of the symptoms attributed by Dr. Young to cervicitis. At one gynæcological clinic which has a large out-patient department no woman is examined per vaginam until she has taken a mixture containing iron and magnesium sulphate for at least a week. The result of this routine is that 70 per cent. of women are cured without further treatment. The very varied opinions on the subject are not a credit to gynæcology.

THE CARNEGIE TRUST AT HOME.

THE programme of the Carnegie United Kingdom Trust during the years 1931 to 1935 is to include an increase of children's play centres, development of a better service of public libraries and public baths, and a more comprehensive policy in the field of adult education.

The sixteenth annual report gives an interesting survey of the success of the playing-field movement as a result of the propaganda begun in 1927. The grants made have been comparatively small, varying from one-tenth to one-sixth of the total cost in each case, but in spite of this local authorities have proved anxious to undertake and carry through schemes for the provision of playing-fields in their areas; only two or three grants have been refused out of a total of 260 offered during the years 1928 and 1929. In the distressed mining areas special grants have been made towards playing-fields, with a twofold purpose: to provide the unemployed miners and their children with opportunities for enjoying fresh air and exercise, and to offer employment to some of the men in the construction of the fields. In many places where fields have been provided under the scheme there is evidence that the demand is in excess of the accommodation, and the authorities are considering extension of their present areas. One of the dangers experienced during the last few years has been deterioration owing to lack of adequate maintenance and supervision. Turf, fencing, and equipment suffer quickly from neglect, and if the playing-fields are to fulfil their function constant care and restoration are necessary. In Scotland a committee has been formed to supervise the spread of the movement, which has hitherto been slower than in England. The demand for play centres for young children has been considerably stimulated by the playing-field movement, and grants are made for equipment, such as swings and see-saws, and for sanitary accommodation and shelters. The value of such play centres in crowded districts can hardly be over-estimated; the danger of death or disablement from accident increases yearly where children have no playground but the streets. Another of the activities of the Trust has been to provide shower bath installations in a small number of selected villages in Lincolnshire. These have been much appreciated, and it is hoped that they will shortly begin to pay their way. The Lindsay Education Authority are making a grant to enable school-children to attend without charge. The model child welfare centres established in various towns during past years are now all recognised as essential parts of the municipal health services. The work is steadily developing. The Rhondda Centre, built in 1927 but not opened for financial reasons, has at last been equipped, and was to begin work in April, 1930.

The new social survey of London, to which the Trust has promised a grant of £1000 when other contributions shall have reached £14,000, has now £12,200 available and will presumably secure the remainder shortly. The survey is to cover poverty, housing, industry, and special subjects. Poverty has been the subject of conferences between school attendance officers, employment exchanges, boards of guardians, police, house and estate agents, and the Charity Organisation Society. Information on housing is being supplied by the various boroughs, and the industrial survey is in the hands of appropriate experts. Special subjects will include, among others, the influx and efflux of population, the social influence of trade-unions, dwellers in neighbouring garden cities, and habits of leisure in the city of Westminster.

THE TRAGEDY WITH B C G VACCINE AT LÜBECK.

OUR Berlin correspondent tells us of the disastrous sequel to the use of B C G vaccine which has been reported from the Hanseatic city of Lübeck. It appears that the Calmette method of protecting infants against tuberculosis has lately been brought to the notice of the Berlin Medical Society and the German Central Tuberculosis Committee, and Prof. His had invited Dr. Weill-Hallé, of Paris, to initiate a discussion at the Charité Hospital in Berlin. In Düsseldorf Prof. Schlossmann nad already reported favourably, and experience at the Children's Hospital at Berlin was similar. At Lübeck, however, it has been otherwise. There the vaccine was employed on the official recommendation of the local health authority and 246 infants were treated on the lines indicated by Calmette. Of these 50 became severely ill with swelling of the inguinal and abdominal glands and other symptoms of acute tuberculosis. Fourteen deaths have been reported and others are expected to follow. Prof. Lange has been sent by the German Health Office to inquire into the cause of the disaster, which has not yet been ascertained. It seems clear that the original culture was purchased in Paris, further subcultures being made in Lübeck by Dr. Deycke, an experienced immunologist, who is confident that no mistake can have been made either in the preparation or in the distribution of the remedy at Lübeck. Local criticism is directed to the fact that the method was applied outside the hospitals and dispensaries and that midwives were instructed to give the vaccine to newly born infants (their parents being agreeable) not under immediate medical control. Prof. Guérin, of the Pasteur Institute in Paris, has however, declared that the vaccine of which a quantity was sent to Lübeck in the autumn of last year was in good condition and that a mistake must have been committed in its application. It was as usual sent in bulk for subculture on the spot, as the ampoules do not travel. B C G, it may be recalled, is a bovine strain of tubercle bacillus, first isolated in 1906, and repeatedly subcultured for 13 years on a special medium of glycerinated ox-bile until its virulence was reduced to a point regarded as safe for inoculation work with living cultures. But although Calmette and his collaborators claim absolute proof of safety on an experience of 400,000 injections, laboratory workers have not all felt happy about the avirulence of the material. Two years ago at the Trudeau sanatorium S. A. Petroff and Arnold Branch found that the vaccine was not constantly innocuous to small laboratory animals. In two instances generalised tuberculosis followed direct inoculation into guinea-pigs and in a further instance tuberculosis was established after the second animal passage. When the vaccine was cultured in a fluid medium the appearance of two types of colonies made the Trudeau workers suspicious of the existence of variants similar to those observed in the reproduction of other acid-fast organisms; and after plating they were able to differentiate two distinct types of

colonies, one of which produced tuberculosis which in time healed, while the other produced progressive disease terminating in the death of the guinea-pig. Petroff's work was confirmed last year in the New York public health laboratories by M. J. King and W. H. Park, although the Pasteur Institute, using his technique, failed to obtain virulent bacilli either by culture or passage. Whatever may be the truth about the immunising value of B C G vaccine—Dr. Stanley Griffith is engaged on investigating it at the Cambridge field laboratories—the Lübeck incident brings to mind the all too obvious fact that the use of live vaccines has its dangers and limitations. It was long believed that the use of living but attenuated virus was essential to the production of a good prophylactic immunity, but as Prof. J. McIntosh pointed out in a presidential address four years ago[1] this belief broke down after the experience of Haffkine with his plague vaccine and Wright with his typhoid vaccine; since then the general trend of medical progress has been to drop the use of living virus for the dead virus or for some of its products. The injection of virus capable of multiplication in the injected body is far from ideal, for when multiplication occurs there is no possibility of estimating the dose to which the patient has been subjected, and in susceptible individuals this may lead to unforeseen results. The reintroduction of the use of an attenuated living virus in tuberculosis was described by Prof. McIntosh as a retrograde step. Who knows, he said, for how long an attenuated bacillus can lie dormant and then assume its former virulence?

SOCIETY FOR RELIEF OF WIDOWS AND ORPHANS OF MEDICAL MEN.

AT the annual general meeting of this Society, held on Wednesday, with the President, Mr. V. Warren Low, occupying the chair, the report for 1929 was presented. Five members have died, six resigned, and six new members were elected during the past year, making a total membership of 284, made up of one honorary, 162 life, and 121 ordinary members. At the end of the year there were 49 widows and 12 orphans in receipt of grants; during the year four widows and seven orphans came on the funds and four widows died. The benefits offered by membership are well illustrated by the grants received by these four widows.

One came on the funds in 1904, her husband paid in subscriptions £31 10*s.* and his widow received in grants £2200. Another who came on the funds in 1918 received in grants £750, her husband having paid £52 10*s.* Another came on the funds in 1915 and received £1050, her husband having paid £35 14*s.*, and the last widow who came on the funds in 1925 received £300, her husband having paid £31 10*s.*

The invested funds of the Society amount to £140,700. The income received from investments was £4244, income-tax returned £764, interest on deposit account £51; £255 was received from subscriptions, and donations amounted to £108. One legacy was received of £140. £5252 10*s.* was distributed in grants, and working expenses were £330.

The smallness of the membership is a matter of concern to the directors, and they desire to bring to the notice of the newly qualified and also the newly married members of the medical profession the advantages that may be gained by joining the Society, which is both provident and benevolent. Should a member die and leave his widow with an income not exceeding £125 per annum, she would, on the present scale, receive from the Society a yearly grant of between £75 and £90, and any children under the age of 16 would receive a yearly grant of £60 each. Over the age of 16 special grants may be made to orphans to enable them to continue their education or start in some profession. These grants in many cases amount to £52 10*s.* a year to each orphan. The amount of the annual subscription is small compared with the benefits that may derived by unprovided dependents of a deceased member. For a member who at the time of his election is under 40 years of age it is two guineas; there are special terms for life membership. Relief is granted to the necessitous widows and orphans of deceased members of three years' standing, and of life members. Membership is open to any registered medical practitioner who at the time of his election is resident within a 20-mile radius of Charing Cross. Particulars may be obtained from the secretary of the Society at 11, Chandos-street, London, W.1.

[1] THE LANCET, 1926, ii., 889.

RESEARCH FELLOWSHIPS IN TUBERCULOSIS.

FELLOWSHIPS for research in tuberculosis are being provided from a fund established in memory of Dorothy Temple Cross, and the first award will be made by the Medical Research Council in July for the academic year beginning on Oct. 1st. The object of the Fellowships, as defined in the trust deed, is to give special opportunities for study and research to persons "intending to devote themselves to the advancement by teaching or research of curative or preventive treatment of tuberculosis in all or any of its forms." Candidates must be British subjects and must hold suitable medical, veterinary, or scientific qualifications. They must also be able to produce evidence of their ability to make good use of the opportunities offered. The Fellowships will preferably be awarded to candidates who wish to conduct their studies or inquiries outside Great Britain. They will, as a rule, be awarded for one year, but in special cases may be renewed. Their value will depend upon the standing and qualifications of the candidate, but will not be less than £300 per annum, with travelling expenses in addition. It is also hoped to award one senior Fellowship of considerably greater value, and with good prospect of renewal for a further period, to a well-qualified candidate wishing to undertake intensive investigation into some special problem of tuberculosis whether under a temperate or a tropical climate. Application must be made not later than June 30th, and further particulars are obtainable from the Secretary of the Medical Research Council, 38, Old Queen-street, London, S.W.1.

A SCHOOLBOY'S SUICIDE.

TWO letters have recently appeared in the press the relation between which is not obvious at first sight. In the one Sir Farquhar Buzzard pleaded for the treatment of the sufferer from "nerves," a minor mental disorder for which treatment is not readily available. In the other the father of a boy who had committed suicide repudiated the suggestion that the lad was a coward. The need for this plea arose from an assumption that the cause of suicide was fear of fagging at school, and the headmaster of the school was likewise compelled to defend himself from the emotional storm aroused by the publicity given to that assumption. The storm was connected with an old controversy about fagging at public schools that need not concern us here; the belief that any boy could have a direct and rational fear of the discipline of present-day fagging so great as to lead to suicide is closely related to the neglect of minor mental disorders which prompted the letter of Sir Farquhar Buzzard. Doubtful points concerning physical disease are in little danger of neglect at inquests; expert assistance is promptly called for, especially if responsibility, direct or indirect, is likely to be fixed upon anyone. But in the much more difficult problems of behaviour the psychologist is seldom asked for an opinion.

In its characteristics this case does not stand alone. Suicides that are apparently inexplicable are common, and sometimes the victim's friends describe his over-conscientiousness, his devotion to work and duty, his

earnest and scrupulous regard for others—qualities estimable in their proper place, but in these cases recognisable as indications of one type of "nervous" disorder and suggesting to the psychopathologist other and deeper emotional stresses. This boy was described as capable, hard-working, and brave, the only evidence of emotional stress being a casual observation that he was subject to notable phases of silence. It is possible that the matter of fagging served as a point of fixation of troubles dependent upon deeper emotional difficulties, just as in the other cases we hear that the victim persistently worried over matters that others regarded as trivial or non-existent. It is the essence of some disorders that the patient suffers from anxiety of unconscious origin; this anxiety must be transferred to something in the world outside, and it may then appear as irrational and absurd. Perhaps the day will come when we shall be able to recognise temperamental difficulties in young people and give timely aid, just as we have already learnt to watch over the physical well-being of the child without waiting for the development of disease.

INFECTION IN ST. KILDA.

ST. KILDA lies 40 miles west of Northern Uist, and is the most isolated of the British Isles. This spring the relief ship sent out by the Scottish Health Department only effected a landing with difficulty at the second attempt, and in former times the island was regarded as almost inaccessible during eight months of the year. These circumstances have long deserved the attention of epidemiologists, and the name of St. Kilda has, in fact, become familiar to the profession in more than one connexion. It is well known, for instance, that formerly more than half the children born on the island died of tetanus neonatorum—a state of affairs which lasted as late as 1890, when Nurse Chisnell began her ministrations. This peculiar mortality had been variously explained before its cause was discovered, and there have been at least as many explanations of the strange way in which the St. Kildeans take cold on the arrival of the first boat of the season. In his "Life of Johnson," Boswell relates that when Macaulay wrote his account of the island, "he was advised to leave out of his book the wonderful story that upon the approach of a stranger all the inhabitants catch cold." To which Johnson replied, "Sir, to leave things out of a book, merely because people tell you they will not be believed, is meanness." Dr. John Campbell, it appears, took a great deal of pains to ascertain the facts, and attempted to account for them "on physical principles, from the effect of effluvia from human bodies." But a lady of Norfolk wrote to Boswell to say that the "explication of this seeming mystery" was so very obvious as to have escaped attention.

> "Reading the book," she said, "with my ingenious friend, the late Reverend Mr. Christian of Docking—after ruminating a little, The cause, (says he,) is a natural one. The situation of St. Kilda renders a north-east wind indispensably necessary before a stranger can land; the wind, not the stranger, occasions an epidemick cold."

As in the time of Mr. Christian, the need of epidemiology to-day is for accurate data, and St. Kilda might still provide some. A few years ago almost every inhabitant took whooping-cough, but unfortunately this incidence of infection on the virgin soil of an adult population could not be studied as it deserved. The opportunity for medical research on the island still exists, but it is rapidly passing. The native population—109 in 1852—is now only 38, to whom should be added the missionary and his family, and the nurse provided by the Highlands and Islands Medical Service. Attempts have often been made to get the inhabitants to leave their home, for it has not fully supported them within living memory. Soon, moreover, there may not be enough men to take boats across to the neighbouring islands where they keep sheep. The captain of the relief trawler says that all save two old men would now be willing to leave, but our Scottish correspondent thinks this is "too good to be true." It does not allow, he says, for the nostalgia of the islander, and he doubts whether the maintenance of the remnant would be any less expensive on the mainland. Meanwhile we learn that a geologist lately spent a long period in verifying the structure of the island, and it seems likely that a medical research student of suitable gifts could make something equally important out of its unusual human material.

INSULIN BY NOSE AND MOUTH.

MANY attempts have been made to devise means of administering insulin which will be free from the inconvenience of daily hypodermic injections. Recently H. Wassermeyer and A. Schäfer[1] have recorded observations on absorption of the hormone from the nasal mucous membrane, when applied either on tampons or in the form of snuff. They find definite evidence that some degree of absorption occurs, the blood-sugar—both in the diabetic and in the normal subject—falling appreciably during three hours following the application. Unfortunately, the fall in the blood-sugar is not proportional to the dose of insulin employed. 100 units have no greater effect than 20 units, and it is apparently impossible to reduce the blood-sugar sufficiently to evoke hypoglycæmic symptoms.

Since the successful management of diabetes entails a nice adaptation of the dose of insulin to the varying tolerance of the patient, and since any chance catarrhal inflammation of the absorbing surface must adversely influence absorption, it is evident that the scope of intranasal insulin therapy is severely limited. Another and more ambitious attempt to solve the same problem has been even less successful. It has been claimed that insulin, when mixed with desoxycholin, is rendered immune to the destructive action of the digestive ferments and can thus be administered by the mouth. D. Kwilecki and K. Silberstein,[2] however, have failed to find any evidence that this preparation (Cholosulin) is of value in diabetes, and they observed dyspeptic symptoms in several patients to whom it was given. Cholosulin, even in such heroic doses as 200 units, does not depress the fasting blood-sugar. If it is given several hours before a meal it certainly tends to lessen the subsequent rise in blood-sugar, but this may well be due to the nausea which it undoubtedly provokes.

The hypodermic syringe remains indispensable to the diabetic requiring insulin.

A CONGRESS OF PUBLIC HEALTH.

Major-General J. E. B. Seely, as Lord Lieutenant of Hampshire, will preside over the annual congress of the Royal Institute of Public Health which meets at Portsmouth at Whitsuntide. After an inaugural session on the morning of Wednesday, June 4th, at which he will give an address on Health and Courage, the congress will adjourn until the following day, when the sectional meetings begin at the Guildhall. The two principal discussions in the Section of State Medicine will be on National Health and the Local Government Act, and on the Slum Problem. Prof. H. R. Kenwood's presidential address will be on the Reduction of Preventable Disease, and among the papers contributed will be one by Dr. C. O. Stallybrass on Variations in Virulence during the Course of Epidemics. Prof. René Cruchet, of Bordeaux, will address the Services Section on Post-encephalitic Parkinsonism and Military Pensions, and Dr. J. B. Christopherson will speak on the Rôle of Dress in the Tropics in Relation to Health and Disease. The chief subjects before the Section of Industrial Hygiene—as is suitable for a Portsmouth meeting—are Health in Seafaring Occupations and the Health of Dockyard Workers; while the section

[1] Med. Klin., March 28th, p. 474.
[2] Ibid., April 4th, p. 513.

concerned with women and children will have discussions on the Slum Child, and on the Prevention of Sickness and Death in Motherhood. Before this section Dr. Doris Odlum will speak on Home and the Adolescent, Mr. W. Clarke Hall on the Problem of the Delinquent Child, and Lieut.-Colonel R. Kuper White on Post-puerperal Disabilities in Women. Sir Henry Gauvain's presidential address to the Section of Tuberculosis will deal with Sun Treatment in England, and Mr. H. Morriston Davies will open a discussion on the Present Position of Surgical Treatment of Pulmonary Tuberculosis.

Each of the sections has arranged visits to centres of interest in the locality, and there are, as usual, various excursions and functions for the congress as a whole. Application for membership may be made to the hon. secretaries of the Institute, 37, Russell-square, London, W.C.1.

MENTAL HYGIENE IN PUBLIC HEALTH.

A NEW conception of preventive medicine and public health work was outlined by Prof. Haven Emerson in his address to the First International Congress on Mental Hygiene held in Washington early this month. He spoke of mental hygiene as a public health problem and gave convincing arguments in support of his thesis that the public health service in its present form is inadequate to the needs of the community. The control of communicable diseases, the protection of maternity and infancy, the detection of physical defects or even of feeble-mindedness in children, and so forth, can no longer be considered the whole duty of the health officer. In the future he may be called upon to account to his constituency for the incidence of suicides, showing correlations perhaps with unemployment, the prevalence of divorce, heredity, sex, and occupation. The fact that the diabetes death-rate in America has risen in the last 70 years from approximately 5 to 20 per hundred thousand is important enough but is of less real moment to the community than that the suicide-rate has risen in the same proportion. It is questionable, he continued, whether investigation of the reasons for a rising death-rate from appendicitis is any more necessary than the analysis, with a view to prevention, of the conditions which have brought about a rise in the divorce-rate from 26 to 68 per hundred thousand in less than 50 years. He did not minimise the importance of diphtheria swabs and typhoid inoculations, but urged that the psychological welfare of the community should also receive attention. According to experienced child-guidance workers, in any unselected group of children of four years of age, considered by their parents to be normal, more than one-third are found on investigation to have characteristic behaviour problems which are likely to develop into personal or family embarrassments. It is not a matter of intelligence, to be dismissed as a problem that the proper ascertainment of defectives would solve. These ill-adjusted children are found among the dull, the average, and the precocious. Evidence of deviation from good mental health may include extreme shyness, severe speech, defects, and the more precise phenomena of tantrums, interference with appetite for and use of food, and enuresis. The problem of public health, according to Prof. Emerson, is to include in the plan of service to parents such personnel as can be trusted to notice aberrations of conduct in the home, to advise parents to seek professional guidance when necessary, and to deal with early and mild disturbances in this field in the same way as health visitors deal with physiological errors in the field of growth, nutrition, and infection. The community should see that the psychiatrist gets to the mean lazy ne'er-do-well before the policeman does, and that the bully, the fearful child, and the miserable man meets a wise social worker before he is forced into an institution.

This stimulating address was a fitting introduction to the deliberations of a congress so important that 53 countries were represented and so interesting to the American people that an audience of over 3000 persons attended the inaugural session. Some of the scientific communications made to the congress were reported in THE LANCET of last week, and another group will be found on p. 1148. The history of the mental hygiene movement, from its inception in 1908, has been one of almost miraculously rapid development. The source of the movement, as Dr. William White pointed out in his presidential address, was the vision and zeal of one man. When he was a student at Yale, Mr. Clifford Beers had a mental breakdown from which he completely recovered. He returned to the community inspired with the purpose of saving others from the sufferings which he himself had undergone and the first committee on mental hygiene was formed in Connecticut with the single object of improving the conditions in mental hospitals. The growth of the organisation was speedy, accelerated by the strong public opinion created by Mr. Beer's book "A Mind that Found Itself," and the concept of definite curative treatment of the insane and of the prevention of insanity began to take shape. It was soon felt that this aim, valuable as it was, constituted only one aspect of mental hygiene, what might be termed the negative aspect. The positive aspect—the guidance of children, adolescents, and employees, which involves the education of parents, teachers, and employers to the knowledge that abnormalities of behaviour at all ages are influenced less by reason than by emotional undercurrents, is even more important. The communications to the congress show how much progress has already been made by Americans and how generous has been their endeavour to stimulate action in other countries. Partly through the good offices of the Commonwealth Fund, London is now equipped with at least three child-guidance clinics and more will come. The spirit of a few enthusiasts has flamed so brightly that it has compelled the attention of the whole world.

RETIREMENT OF MR. HAYWARD PINCH.

THE retirement of Mr. A. E. Hayward Pinch, F.R.C.S., after 21 years' work as medical superintendent and director of the Radium Institute, is announced to take place in June next. The reorganisation of the work of the institute, consequent on its affiliation with the Mount Vernon Hospital, and the setting up of the new Post-Graduate School of Radiotherapy, is in progress, and Mr. Pinch's state of health prevents him from undertaking new and more onerous duties. The committee of the Radium Institute, in announcing Mr. Pinch's impending retirement, put on record their appreciation of the service he has given during his long tenure of office, and have elected him a member of the honorary consulting staff.

THE sixth annual meeting of the National Institute for the Deaf will be held at Church House, Westminster, on Friday next, May 30th, at 3 P.M. Lord Charnwood, the President of the Institute, will preside, and Mr. Stanley Baldwin will address the meeting.

ROYAL INSTITUTION.—The Rockefeller Foundation has offered £20,000 for endowment of research in the Davy-Faraday Laboratory on condition that £50,000 is raised from other sources. This offer has been accepted.

JUVENILE BLINDNESS IN SCOTLAND.—Mr. William Adamson, the Secretary for Scotland, recently opened large extensions of the workshops of the Aberdeen Asylum for the Blind, which have cost close upon £5000. Mr. Adamson pointed out that the statistics warranted the hope that the newly born blind would shortly entirely disappear in Scotland. They have already done so in the north-east of Scotland, there no longer being a single blind child under 5 years of age in the county or city of Aberdeen, or in the counties of Banff and Kincardine.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles Contributed by Invitation.

LXXIII.

THE SIGNIFICANCE OF IDIOPATHIC SKIN REACTIONS.

PART I.*

SKIN reactions in cases of inherited or idiopathic sensitisations have had too much medicinal virtue ascribed to them; in their clinical use they have almost developed into one of the pathological rituals designed towards magical healing. On the other hand, when sensitisation acquired through infection is in question—e.g., the von Pirquet or the Dick test—they are used too capriciously, no doubt because some coördinating pathological principle is lacking. The two types of reaction are quite distinct.

We have on the one hand the skin reactions which fall into line with the histamine reactions described by Sir Thomas Lewis—reactions taking 7 minutes to begin and about 20 minutes to finish. Typical of these is the effect of grass pollen on the skin of the hay-fever subject. On the other hand, we have a rather heterogeneous collection of reactions coming up in different times, sometimes showing best after three hours, sometimes best after 24 and lasting for an indefinite period; these group themselves round the old tuberculin reaction and may perhaps be typified by the von Pirquet. The first group are hereditary or idiopathic (the toxic idiopathies), the second are the result of some change in our circulating blood and fixed cells due to infection. It is true that these differences may be only apparent, since the *tendency* to tuberculosis, for example, is itself hereditary and presumably idiopathic, and no one knows how the hereditary tendency towards hay-fever develops into the actual disease.

In current parlance, "skin reactions" usually betoken tests in the first or idiopathic group, and it is with these that I propose to deal in this article, starting by describing as typical the hay-fever reaction. What is here said of hay-fever is applicable to all the others—horse asthma, egg sickness, bacterial sensitisation, and the rest.

Hay-fever Reaction.

In this asthma group of diseases there is a tiresome muddle in nomenclature. Some are named by the protein irritant which produces them, e.g., *hay*-fever, *horse*-asthma; others are named by the most prominent symptoms these irritants produce, e.g., asthma, urticaria; others again are named from the neural mechanism involved, e.g., *vasomotor* rhinitis, "reflex" asthma, and so forth. In each case the sponsor gave the name according to the part of the pathological mechanism which most impressed him; the terms, therefore, are not mutually exclusive and it is necessary to emphasise that the term "hay-fever" is *not* a popular synonym for rhinorrhœa, vasomotor rhinitis, conjunctivitis, or laryngitis, though it frequently gives rise to these symptoms. Hay-fever is the reaction which takes place when grass pollen comes in contact with people with an idiopathic sensitiveness to it. In bringing a minimal quantity of grass pollen into contact with a selected area of such an individual we are producing a miniature attack of hay-fever; if the selected area is visible we can see the attack and can thus make it diagnostic of the spontaneously occurring disease. This in practice confines our experimental area to the surface of the body, but it is important to keep clearly in mind that grass pollen works out of sight also. If sniffed up the nostrils of hay-fever patients it provokes a rhinorrhœa (Blackley); if injected up the rectum it provokes pruritus and tenesmus (Dunbar); if swallowed it provokes nausea, vomiting, and even diarrhœa; and if it gains access to the blood stream it may provoke any of the symptoms of the toxic idiopathies—asthma, rhinorrhœa, urticaria of any intensity up to angioneurotic œdema, eczema, migraine, epilepsy, functional albuminuria, &c. As has been said above, the grass pollen reactions are typical of what may be done by any of the other protein irritants; therefore any skin test showing a protein sensitisation may throw diagnostic light on any of the above-mentioned disorders.

A diagnostic reaction with grass pollen may be carried out by bringing it, or an extract of it, into contact with the living tissues of the sensitive person on some area of the body where we can observe the result. In practice four different methods can be used.

Injection into Conjunctival Sac.

Pollen (or preferably, a very dilute extract of pollen) may be dropped into the conjunctival sac of the eyeball; this area is perhaps the most sensitive in reacting. In a positive reaction the patient notices a tickling in the eye, and he may perhaps sneeze owing to an overflow of the extract down the lacrymal duct and so into the nasal cavity. In about seven minutes from the instillation of the pollen, the eye will be seen to be more watery than its fellow of the opposite side, the blood-vessels will become more noticeable, especially towards the inner canthus, and the caruncle will become slightly pinker. In a minimal reaction such as this the effects should be lessening in 15 minutes, and should have disappeared in from 20 to 25 minutes. With stronger extracts more definite changes are observed and they last longer; the whole eyeball gets bloodshot, the irritation becomes really distressing, and the effect may last for hours; presumably, if sufficient pollen substance were added to a sensitive enough case the conjunctiva would blister, and flake off as may happen in severe cases of the naturally occurring disease. It is therefore expedient in a new case to begin with a very weak dilution indeed, and gradually to increase the strength until a minimal reaction is obtained. The strongest extract will give no reaction on the normal man, but in the hay-fever subject the intensity of the reaction will depend on the extent of the pollen sensitiveness of the individual. In other words, the more sensitive the individual the weaker must be the extract which gives just a minimal reaction. It is thus possible not only to make a sure diagnosis of pollen sensitiveness but to gauge the intensity of the sensitisation by noting what strength of pollen extract will cause a minimal reaction. The most sensitive case I have ever tested reacted with one drop of 1 : 330,000 extract of *Phleum pratense* pollen, which would represent perhaps the extract from a sixth of a millionth of a gramme of the pollen. At the other end of the scale, if patients do not react to a drop of the 1 : 200 extract they will not react at all—i.e., they are not subject to hay-fever. This quantitive interpretation is not, of course, absolutely true, but it is true enough for therapeutic purposes with certain reservations. For example, the intensity of the reaction depends to some extent on the emotional state of the patient. A combative self-reliant person may, if sufficiently keyed up, diminish quite considerably the customary reaction, while an anxious emotional person may increase it (this may be a question of adrenalin in the circulation); but no emotion can produce a reaction in a non-hay-fever subject or can abolish it if a sufficiently strong extract is employed with the true hay-fever subject.

This eye method is a very delicate—perhaps the most delicate—test of sensitisation, but it suffers from two inherent defects: (1) that there is only

* Part II. will appear in our next issue.

one eye to test, since the other has to be kept as control; (2) it is not justifiable to take any risk with the eye either by instilling a normally noxious substance or by using too strong a reagent. Pollen causes such a strong reaction that very dilute extracts have to be used; but when a bland innocuous substance like cow's milk is suspected it is convenient sometimes to put a drop into the conjunctival sac for diagnosis.

Application to the Lips.

If grass pollen is applied to the lips of a hay-fever subject a feeling of burning or pepperiness will be experienced in a few minutes, and the lips will swell, become inflamed, and show blisters—the subjective and objective intensity of these phenomena varying with the sensitiveness of the person tested, and with the strength of pollen extract employed. In practice, this is not a very convenient method of testing; it is mentioned here only because it may be accidentally applied by nurse or mother to the newly-weaned child, when they try to force on it some new food to which it is sensitive. To quote a mother's story: "The baby fought and screamed for half an hour while we tried to get some egg into his mouth; then we noticed that his lips were all inflamed and swollen and covered with blisters; we stopped, supposing that he was fighting because his lips were sore. A week later, having first noted that his lips were all right, we saw them swell up after contact with the eggy spoon."

Intradermal Injections.

If pollen or pollen extract is brought into contact with the unbroken skin of a hay-fever subject usually no reaction occurs, though some very thin skinned women and children may get a little itching and inflammation. The reacting substance must penetrate the dead superficial layers of the skin to the living cells beneath, to the cutis vera, in fact, before the reaction can be produced. It may be rubbed in (thoroughly unsatisfactory); it may be put into an abrasion, scratch, or prick (the method in general clinical use); or it may be injected intradermally (the method mostly used for experimental work in the laboratory).

Whatever method may be employed to reach the cutis vera, when the protein irritant reaches sensitive living cells, in about seven minutes an itching will be experienced and the tested area will show a red patch; a little later this red patch will become an œdematous raised white weal. Simultaneously an erythematous blush will develop round the weal to a distance of from a quarter of an inch to an inch or two according to the intensity of the reaction. Meanwhile the weal may become more pronounced, with possibly a little drop of serous fluid exuding through the scratch, and if the reaction is at all intense the white raised area will spread laterally over an inch or more, often in curious pseudopodial projections as the œdema fluid tracks through the thickness of the skin along the lines of least resistance.

These phenomena reach their height in 10 or 15 minutes, and are usually noticeably fading away in 20 minutes. Such an intense reaction as this, with a dead white weal of irregular margin which could not be covered by half a crown, surrounded with an erythematous blush which could barely be covered by the hand, is a striking and unmistakable reaction which could be read at a distance of ten yards; but in practice many smaller or even minimal reactions occur, and the decision what is and what is not a reaction becomes important. It is necessary in fact to make a control test with an equal amount of scratching or rubbing-in, on a neighbouring site, using in place of the pollen (or whatever it may be) a neutral substance such as normal saline. No reaction can be accepted as positive unless there is an unmistakable difference between it and that on the control site. These precautions are the more necessary because dermographia tends to "run" in the family of sensitives. In fact, it may itself be classed as one of the toxic idiopathies.[1]

Testing by Proxy.

Lastly, the action of grass pollen on hay-fever subjects may be tested by proxy. If some blood is drawn from the vein of a hay-fever subject (1 or 2 c.cm. are ample) and allowed to clot, the serum can be injected into the thickness of the skin of a non-hay-fever man (e.g., the investigator); if this is skilfully done the skin can be well "mattressed" with the hay-fever serum over an area equal in size to a shilling or sixpence without any noticeable scarring, and the "mattressing" will quickly subside till in a day or two nothing is noticeable at the injected site (which therefore had better be outlined with indelible ink). If grass pollen is subsequently brought to this site, either by any of the methods described above or by injection into the vein of the investigator, then the site sensitised by the hay-fever serum, and only this site, will swell, giving the characteristic reaction; but if the pollen reaches the sensitised site diluted, via the blood, and not concentrated in a prick or scratch, it will give an œdematous reaction more approximating to angio-neurotic œdema, incidentally supplying a useful indication of how that condition may arise. Thus, a diagnosis can be made on serum sent through the post. A well-marked food sensitisation can sometimes be tested for in this way with striking results; all that the proxy has to do is to eat the suspected food.

JOHN FREEMAN, D.M., B.Ch. Oxf.,
Director of the Department of Clinical Bacteriology, St. Mary's Hospital.

The Services.

ROYAL ARMY MEDICAL CORPS.

THE undermentioned Lts. (on prob.) from the secd. list are restd. to the estabt.: J. E. Snow and E. G. C. Darke.

Lt. (on prob.) T. G. D. Coneys resigns his commn.

ARMY RESERVE OF OFFICERS.

Maj. C. L. Emmerson, R.A.M.C., to be Divl. Adjt., 55th (W. Lan.) Div., T.A., vice Maj. R. R. Evans, vacated.

Capt. F. R. How from 12th Lond. R., T.A. Res. of Off., to be Lt.

TERRITORIAL ARMY.

Lt. T. F. Arnott (late Cav. Res. Regts.) to be Lt.

[1] Freeman, John: Pathological Mechanism of the Asthma Syndrome, THE LANCET, 1928, i., 288.

WEST LONDON HOSPITAL.—Last year 3745 in-patients were received; there were 2232 major, and 4396 minor, operations, and 12,720 X ray plates were used.

ST. GEORGE'S HOSPITAL.—Presiding last week at the annual court of governors of St. George's Hospital, Prince George stated that unless an additional income of at least £20,000 could be assured the time would come when its activities would have to be curtailed. He added that last year some 5000 in-patients and 39,000 new out-patients were treated, and that 250 infants were born in the hospital.

HOSPITALS AND MOTOR ACCIDENTS.—Glasgow Royal Infirmary is publishing weekly figures of the number of motor accident cases treated. In the three weeks ended on May 10th the infirmary treated 76 such cases, 37 of which were admitted. During March the three Glasgow voluntary hospitals treated 222 motor accident patients, 31 of whom entered the wards.—Last year Leeds Infirmary dealt with 1135 motor cases, which cost £4307, and the amount paid was £167.—Blackpool Victoria Hospital treated 148 accident in-patients and 26 out-patients at a cost of £1052; £176 was recovered.

Special Articles.

SOME OBSERVATIONS ON THE AFTER-CARE OF TUBERCULOUS PERSONS.

BY P. C. VARRIER-JONES, M.A. CAMB., M.R.C.P. LOND.,

MEDICAL DIRECTOR, PAPWORTH VILLAGE SETTLEMENT, AND HON. MEDICAL DIRECTOR, ENHAM VILLAGE CENTRE; LECTURER ON TUBERCULOSIS, STATE MEDICINE SYNDICATE, UNIVERSITY OF CAMBRIDGE.

THE Minister of Health (Mr. Greenwood), in his speech in the House of Commons on April 29th, has again focused attention on the important problem of the after-care of the tuberculous person. He said: "With regard to tuberculosis, the experience of village settlements and the principles on which their successful working depended had been brought to the notice of certain local authorities where the conditions seemed favourable to the establishment and maintenance of similar settlements. Even if settlements were provided for all tuberculous patients for whom they would be appropriate there would still be a number of people for whom after-care would be required. He hoped that local authorities, as the next move in the campaign against tuberculosis, would consider and experiment in methods of after-care." Again, in opening the new sanatorium recently built by the Essex County Council, he used the following words: "Sanatoriums could not provide assistance of a permanent nature, as patients, on leaving them, returned to unfavourable conditions. It seemed a little short-sighted for money to be devoted to the building and maintenance of sanatoriums when next to nothing was done to provide proper after-care treatment. He hoped that attention would be given to this problem."

While these official pronouncements are sufficiently important to warrant attention, they are by no means new to those of us who are daily working at the problem. Indeed, the problem is forced upon the attention of all those who in any way are in touch with the tuberculous population, whether at the dispensary or the sanatorium. The private practitioner has to face the difficulties of the situation in his daily work and especially the most serious aspect of the problem. Thus, when he has diagnosed pulmonary tuberculosis and succeeded in having the patient recommended for sanatorium treatment, the position is for a time relieved, but later, although the good results of this treatment are obvious, the patient returns home—to a house as unsuitable as it can be for any form of treatment, and the practitioner feels grave anxiety about the future, in spite of the assistance of the local tuberculosis officer and the palliative measures then put into force. Visits to the dispensary take place at regular intervals, reports are written at stated times—but the patient goes downhill, and the conditions at home go from bad to worse. Can the patient be readmitted to a sanatorium? Sometimes this question is answered in the affirmative—sometimes not. If he is readmitted there is a spell of comparative ease—the great burden on the family is for the moment relieved, but when the patient returns home once more the whole dismal story is repeated. The position of both the patient and the family becomes acute.

Further, a powerful deterrent in preventing the early case from accepting treatment is the fact that, if it were known that he had had treatment in such and such a sanatorium his economic future would be in jeopardy. If the patient could feel certain that his job would be waiting for him on his return from a sanatorium, if he were sure that when he was asked what he was doing during this absence his answer would not mean that all doors of employment were closed to him, he could cheerfully accept treatment. To secure the treatment of early cases their freedom from economic chaos must be guaranteed. The public health service working under the county councils has prepared schemes embracing the medical aspect, but has only slightly, if at all, touched the economic aspect, while the boards of guardians have in some measure tackled the economic side of the question, but very imperfectly. The recent union of these two services combined under one local authority provides a great opportunity for dealing with tuberculosis on the broad lines which logically should be adopted. To divorce medical treatment of the disease from the economic treatment found necessary has been responsible for the lack of efficient after-care in the past. To amalgamate forces for the combined medical and economic treatment is not only obvious but will, in the immediate future as well as in the long run, save the country a great sum of money. But it is not possible to persuade employers to take back the employee. They will not do it, and it is no good shifting the burden of unemployment of the tuberculous on firms and employers who are already paying the State to do the very thing. It is as if we said "We cannot solve the problem, so let us shift it on to manufacturers and other employers to solve for us." All who have worked in the tuberculosis field know that a solution cannot be obtained in this direction, and that the difficulty of persuading employers of labour to act as philanthropists on a large scale should have been foreseen. It is economically impossible for them to do so, and it is therefore essential to find some other method of solving the problem of the employment of the tuberculous.

The alteration in the administration of local authorities which came into force on April 1st of this year makes it possible to take a new view of the after-care of tuberculous persons. For the first time one authority, and one authority alone, is responsible for the three aspects of the tuberculosis problem, the medical, the social, and the economic. Before this time these three corner-stones were in three different buildings, as it were, each supporting structures which should have been amalgamated into one concrete whole. We are now placed in what should be a favourable position to keep these three essentials as one. The medical aspect can be securely dovetailed with the housing question; both can be anchored to the key of the situation—namely, the economic. Progress on broad sound lines should now be possible. Local authorities are already manifesting great interest in the question, and naturally the finance of the scheme interests them not a little. It is not necessary, however, for any local authority to find all the capital involved so long as it will bear its fair share of the expenses of each patient and his family.

VILLAGE SETTLEMENTS: SUGGESTIONS AS TO NATIONAL DEVELOPMENT.

I recently submitted a memorandum to the Ministry of Health indicating the difficulties now standing in the way of an increase in the number of village settlements, and suggesting means by which they can be overcome.

There is, the Memorandum ran, no doubt that further village settlements would be established around and adjoining existing sanatoria if the primary obstacles of finance and of personnel could be surmounted.

(A) FINANCE.

The capital cost of a village settlement of the size of Papworth, excluding the hospital and sanatorium section, should not exceed £100,000. Such a settlement could house and support some 500 persons, including 100 married and 80 single tuberculous breadwinners who would be unemployable in any but village settlement conditions.

The cost of maintaining these 500 persons at a village settlement should certainly not exceed £1000 per annum. At Papworth the community only incurred a trading loss of some £150 in 1928, so that £1000 should be an adequate figure to meet almost any contingency.

The cost of maintaining these same 500 people outside a village settlement, however, would be far greater. With the breadwinners precluded from winning bread they could not avoid becoming a public charge. The tuberculous breadwinners would in many cases spread infection amongst their families and, through a breakdown, be compelled to be readmitted to sanatoria. Estimating the cost of normal maintenance (from the unemployment fund, friendly societies, the guardians, and other sources) at a minimum of 10*s.* per person per week, an annual charge of £13,000 is produced. The cost of readmitting a proportion of these tuberculous persons to sanatoria, and admitting new cases infected by them, would almost certainly represent a minimum additional annual charge of £1000. On quite a conservative basis, therefore, it is evident that the cost of maintaining these 500 persons outside a village settlement amounts to at least £14,000 per annum. Charges at this rate are in fact now being borne by the various public and private bodies who are responsible for the care of tuberculous workers and their dependents.

The admission of these 500 persons (men, women, and children) to a village settlement would therefore save these bodies not less than £13,000 per annum. £13,000 per annum is sufficient to provide for the service of a 5 per cent. loan of £130,000, amortising the whole sum in 15 years. Therefore, if the public and private bodies above referred to were to be given the statutory power to divert their relief expenditure in such cases to the service of village settlement loans, they could borrow the whole of the necessary capital in the ordinary way, and repay it within 15 years. At the end of this period the settlements financed by this means could accept and provide for normally unemployable persons and their families at practically no cost.

Formation of a National Association.

This proposal could be carried into effect in one or other of two ways:—

(1) By the formation of a Village Settlements Department at the Ministry of Health; or

(2) By the formation of a National Association of Village Settlements on which the Ministry would be responsibly represented.

In the former case the Ministry, on receiving an application from a local authority for the provision of a village settlement within its area, would investigate the circumstances in relation to already existing settlements, local requirements, &c. If satisfied, the Ministry would provide the capital sum required and the local authority would agree to contribute 10*s.* per week per person settled for a period of fifteen years, and 1*s.* per week per person settled thereafter. These contributions would repay the capital sum advanced, with interest, and provide adequately for any revenue losses incurred. No cost whatever would fall upon the national exchequer.

In the latter case an association not for profit would be registered under Section 20 of the Companies Acts, and managed by an expert body approved by the Ministry of Health. This association could affiliate to itself such approved existing settlements as might wish to join; and any local authority desiring to establish its own settlement would be advised to apply to the association. The association would then carry out the investigation indicated in the preceding paragraph, and in the event of approval would undertake to establish a settlement for the reception of suitable cases nominated by the authority on exactly the same terms. The contract with the authority would form the basis for an issue of 5 per cent. debentures by the association. Such an issue, secured upon a contract with a municipality, would rank with corporation issues; and if, in addition, a Government guarantee as to capital and interest were provided, the issue would rank as a trustee security. Practically no risk would be incurred by the exchequer under such a guarantee, and its grant might enable the issue to be made at a lower rate than 5 per cent., while the whole business of the association would, of course, be subject to the close scrutiny, if not the absolute control, of the Ministry of Health.

Of these two methods I am inclined to advise against the adoption of the first, since each settlement would have its own industries, and the fact that these were directly controlled by the Ministry and local authorities might create opposition to the whole scheme in certain quarters. Under the second scheme, this objection could not be maintained, while the Ministry would have almost as great a measure of control as it would under the first scheme.

Three Practical Points.

Attention is directed to three points:—

(1) That the figures employed are not intended to indicate the "ideal size" of a village settlement. They are simply used as an illustration. The size of a village settlement is only limited by its own inertia.

(2) That the whole of this scheme can be carried out without adding one penny to present expenditure upon social and health services. On the contrary, there would be a considerable ultimate economy depending entirely upon the extent to which the scheme was developed, for after the repayment of the original capital sums, the weekly contribution per person settled could be reduced to 1*s.*

(3) That the only action which need be taken by the Government is that required to secure the passing of an Act enabling local authorities to participate in the scheme in the manner proposed.

(B) PERSONNEL.

Past experience has shown that village settlements may cost so much to maintain as to render them impracticable, however desirable they may seem on medical and humanitarian grounds. So far from contesting this, I admit that village settlements may prove highly expensive; indeed, I would go so far as to say that they are bound to be disastrously expensive unless the personnel, both medical and industrial, is most carefully selected. This care in selection extends not only to those holding executive positions, but to those selected for settlement also, and local authorities should bear in mind that not only will a certain proportion of medically suitable cases decline to enter a village settlement, but that a percentage of those who are medically suitable and willing may be temperamentally unsuitable. It is for the residue that village settlements are needed, and that residue will increase in numbers as the scheme develops and its advantages become more apparent; so that while the number of suitable persons desiring settlement may not now be large, it will tend to increase more and more rapidly as time goes on.

Provided that the right principles are adopted there is no reason for any village settlement to fail. At Papworth certain principles have been evolved by the process of experiment, and their adoption at Preston Hall has met with success. It is not too much to suggest, therefore, that if the principles of village settlement work are fully understood and rigidly adhered to success will result.

It would, in my view, be a great mistake to sanction the establishment of large numbers of village settlements before trained personnel is available to guide them. And since theoretical training alone is useless, I suggest that the Ministry should sanction the training of medical personnel at Papworth and Preston Hall, though I have no authority to speak for Preston Hall.

While there is at the present time a dearth of medical and industrial personnel with village settlement experience, there is no reason to believe that this condition is chronic. As the scheme develops so will personnel become available, since village settlements provide considerable scope for enterprise both in medicine and in other branches of endeavour, and the association of reasonable remuneration with scope for initiative represents a combination which has never yet failed to attract the best elements in the population.

Let us clear our minds for a moment as to what we are attempting to do. It is nothing less than to stamp out tuberculosis. Everyone agrees that to do this the early cases must be treated and cured. But, as already pointed out, early cases are not available for treatment, on account of the fear of thus ruining their future economically. Suppose, however, that this fear of economic disaster can be removed, and that a man knew in the event of his becoming tuberculous that he would receive immediate treatment, that his family would be supported while he was receiving treatment, and that if he proved to be suffering extensive and permanent damage he would be able to live and work permanently in a village settlement with his family, the whole tuberculosis problem would be altered. Let us remove the fear of poverty after treatment by making it known that village settlements exist to protect the tuberculous worker from the economic consequences of his disease and manifestly there will be many more early notifications. Even so, many cases would not be discovered until too late, until, that is, extensive damage had been done, but the ratio of early to moderately advanced and advanced cases would slowly but surely increase. Instead of 40 per cent. sanatorium discharges requiring permanent settlement, the proportion would diminish to nearer 20 per cent., and the remainder—i.e., 80 per cent.—having received treatment early, would be fitted to resume work as economic units in the outside world.

TRAINING OF YOUNG CHILDREN.

PROF. BLATZ'S LECTURE.

ON May 13th, at University College, a lecture entitled Modern Theories of Habit Training of the Pre-school Child was given by Dr. W. E. BLATZ, assistant professor of psychology in the University of Toronto. Prof. C. E. SPEARMAN, F.R.S., in introducing the speaker, said that the movement in favour of child guidance was spreading rapidly. Experience showed that adult criminals and undesirables had nearly all been difficult or undesirable children. England had been tardy in adopting the movement, in which the United States of America had led the way. The United States were fortunate in many ways; for example, the different States were independent, and those which were progressive enjoyed great opportunities in consequence; besides this, wealthy members of the community would contribute freely to institutions both in their own country and abroad; they were even ready to subsidise the trial of new methods. They had established a child guidance clinic in this country and had invited a number of persons to visit similar institutions in America, and he had himself accepted such an invitation. But he could say that he had found the best work in this field at Toronto under the inspiration of Prof. Blatz. In a pre-school nursery there he had seen 17 children playing with an entire disregard of the students who lined the walls, and made systematic observations. Prof. Blatz had a more substantial backing of evidence than was usual with speakers on this subject.

Prof. BLATZ began his lecture by saying that he had never been satisfied with the analysis of motives found in text-books. Either this subject was crowded into a few paragraphs at the end of a chapter or a whole book was written about it, with recurrent use of the word "instinct." He proposed to speak entirely of children under five years of age, and to avoid the words "instinct" and "purpose."

Any factor which influenced human behaviour could be called a motive; he made no attempt to distinguish between motives arising outside the organism and those from within, because the individual was never separated from his environment. He must also deny that he was a "behaviourist," since it was impossible to maintain a strictly behaviourist psychology in dealing with living persons.

The Primary Motive.

To interest the psychologist the child must be born alive, and must express life in terms of the function of the whole. The primary motive was life. Children in all circumstances did something, performed some action, and at some stage they attempted to answer the question: "Why am I alive?" The foundation of all religions was an attempt to answer this question, but so far none had answered it in a way which was unassailable. Before the age of four the child was little interested in the answer; from four onwards he began to ask questions having a bearing on it, but up to that time he was not affected by the primary motive of life. Secondary motives must therefore be considered. Why did a child do the things he did? Why did he eat his food on one occasion and fling it at his nurse on another? The case of the mother who had been advised by the pædiatrician to give her child spinach might be considered. She stood over the child with anxiety on her countenance, offering spinach; the child, realising the anxiety, felt that this was the moment to assert himself and throw the spinach on the floor.

The Attitudes.

Adults were described as having differing tastes, and taste was sometimes called feeling tone. There was no such thing per se; all tastes developed from a form of behaviour present at birth. If a new-born child were allowed to suck a finger dipped in a solution of sugar he would behave in such a way as to express satisfaction, while if the finger had been dipped in a quinine solution the response would be one of resentment. There was therefore a twofold result to all sensory impressions—acceptance and rejection. They were antitheses and could not appear simultaneously. From these the child developed a series of reactions to all sensations, and a classification was gradually built up. But an error crept in which made him ascribe the quality to the object, not to himself. Pleasantness or unpleasantness was not really resident in the object but in a concept which he had to develop. This was proved by the fact that tastes were divergent; one object was not the same to all persons, nor did it necessarily remain the same to any given person.

To take an example, if a hungry boy was offered a slice of jam roll he would eat it with enthusiasm, but if helpings were continued indefinitely he would at last reject it, and might even perform the final act of rejection by vomiting. The rejection of children was similar to the disgust of adults, and the taste of adults depended on training, not on inherent qualities in the object. This meant that we held the taste of our children in our hands; we could decide whether they should have a preference for jazz or classical music. In Austria small children were being encouraged to paint, and showed tastes usually ascribed to adults. By analysing his past history it was possible to decide whether or not a child would eat spinach, and by training it was possible to get him to eat anything he was offered. At the Toronto clinic children took cod-liver oil readily, and asked for it if they were accidentally passed over, simply because they were taught to regard it as a food. If it were treated as medicine and the child was forced to take it the atmosphere would demand resistance on his part.

The Appetites.

The appetites, of which hunger, thirst, rest, elimination, and sex, were examples, were connected with physiological functions of the body, and waxed and waned in intensity. Five to eight hours after birth a child became restless and cried; it was then fed and fell asleep. After a few hours the same cycle would be repeated, and the waxing and waning of hunger would continue throughout life. Nobody knew when we ought to be fed, how much, or why. The pædiatrician asserted that it should be every four hours during infancy, without night feeds, and after a fortnight of this routine a child would be hungry at the correct times. This appetite, then, had a physiological background; it was cyclic, had a sensory component, hunger, and could be brought under individual and social control. Training arranged that the behaviour called forth by hunger should be socially acceptable. Later training would enable the child to use the socially accepted implements to feed himself.

Sex was a similar phenomenon to hunger. Like hunger it was potential at birth, and did not depend on puberty for its development; masturbation quite commonly occurred at six months. The cycles were longer than in hunger, but it could also be subjected to a definite control, both individual and social. The social control in this case was enormous, with laws to enforce it, though no one would think of taking legal measures against a man who ate with his knife. Sex was no more important than hunger, and possibly somewhat less so; but no time was spent on sex education and not more than 5 per cent. of persons received considered instruction before marriage. Children were left ignorant on the subject, and this was the reason for the many cases of sex delinquency. They should be instructed in this subject as carefully as they were taught to eat.

Elimination was wrongly regarded by many persons as a function directed by Providence.

Bed-wetting, for example, should never occur after 2½ years of age. Of the cases that persisted beyond this age 2 per cent. were pathological, but 98 per cent. were amenable to habit training and could be cured in six months. It was impossible to exaggerate the effects on a child of this condition. He was exposed either to punishment or ridicule, and his sense of inferiority made it impossible for him to adjust himself to his surroundings.

Sleep was the response which the child acquired as a satisfaction of the appetite of rest. A child should be taught when and how to sleep. The text-books said that during the first month of life a child slept 22 hours out of the 24; by actual observation he had never found the hours of sleep to exceed 18. No one knew how long we ought to sleep, and it was entirely a matter of habit and convenience.

The Emotions.

Watson had made the first really valuable experiments on emotions in children. He found that infants were potentially emotional, but showed only two types of emotional response; the first was fear, which was produced by a sudden change in environment, such as the occurrence of a loud noise, and it was expressed by a movement of flexion and a sudden inspiration. Anger, the second emotion, was produced by preventing the child from fulfilling some some desire. If the wrist were taken between the observer's finger and thumb so that the child could not withdraw the hand, it would first make vigorous attempts to free itself; when it failed it would express its resentment by a movement of extension and an expiratory cry. The infant had no other emotions, and adult emotions were complexities of these. It was impossible to stamp out fear or anger, but we should train the child to fear those things which it was socially acceptable that he should fear, and be angry when it was socially accepted that anger was desirable.

A child should never be given what it wanted when it showed anger as otherwise it would count on gaining its ends in this way. But it must not be concluded that every child who showed anger was spoiled. Anger was a normal quality at 2 years of age; it increased up to 3, and then gradually diminished up to 5.

The psychiatrists talked of psychotic children, but Prof. Blatz did not recognise such cases. In all the examples he had observed the fault had lain in the training. He had seen a 6-year-old boy, described as psychotic, in a children's court, who had refused to answer the questions of a Binet test. At last his mother had been sent out of the room and he had been told she would not return until he consented to do the test. For 18 minutes he had given an exhibition of mania, flinging objects on the floor, and shouting and screaming. No one had touched or interfered with him. At the end of that time he had stopped and seated himself, the mother had come in, and he had performed the tests. The mother, however, had been less educable. She had seized him, exclaiming: "Wait till I get you home!" But when that boy was placed in a proper environment, as he would be, he would find this behaviour would not get him what he wanted, and would become normal. His intelligence quotient was high.

Self-assertion reached fruition at the age of 2, and remained one of the most potent motives throughout life.

Prof. Blatz referred to the curious anomaly whereby nursery schools in England and Canada tended to be the monopoly of the children of the under-privileged classes. In Canada children were expected to attend school from 8 to 16 years, so that all their important years of early childhood were unsupervised. He hoped to see a revision of the law, requiring children to begin school at 2 years and to leave when they had completed the curriculum adapted to their intellectual level.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT).

Insurance Data for Medical Research.

I AM glad to see, from the First Annual Report, that the Department of Health for Scotland are "considering a method whereby the particulars recorded on medical certificates may be made available to them shortly after issue. This would give complete and trustworthy data from which may be compiled statistical records showing, inter alia, the illnesses to which incapacity is ascribed and the loss of working time in each area arising therefrom. It is hoped, incidentally, to adapt this procedure to supply information on certification which is necessary for administrative purposes." The Department are to be congratulated on this effort to make some use of the hundreds of thousands of medical cards now in their possession. Some years ago the Ministry of Health Medical Department issued an admirable study on rheumatism and the data were taken from the records of the insurance practitioners. Why these data have not been studied on a much larger scale is difficult to explain either for England or for Scotland. The insurance practitioners are required to make returns and fined if they do not. It is regrettable that this gold mine of medical facts has received so little attention during these 18 years.

Insurance Domiciliary Service and the New Local Government Act.

The Department are also giving careful consideration to the problem of securing to the insured person the institutional advantages of the new Act. "With the passing of the Local Government (Scotland) Act, it is to be expected that local authorities in Scotland, in coöperation with the great voluntary institutions which have served the insured and non-insured population in the past, will develop a service which will be of great value to all. The Department realise that to secure the fullest value from the organised medical services of the country a definite relationship must be established between the insurance practitioner and these institutions, and consideration is being given to the best method of securing full consultation and coöperation between all the parties concerned." This great flaw in the insurance system will now be rectified. It is gratifying to find that this immense clinical problem is brought by the Department into the front place. This new departure in "treatment" policy, as well as in the handling of the medical returns, will be welcomed by all interested in developing the efficiency of the national insurance system.

Edinburgh Royal Infirmary Appeal.

The appeal for £500,000 for Edinburgh Royal Infimary is now being launched, and at a meeting, convened by Lord Provost Whitson, officers were appointed to take charge of the procedure. Colonel J. M. B. Scott was appointed Appeal Director, and Mr. J. D. Imrie, City Chamberlain, will act as honorary secretary and treasurer. The case for extension of the infirmary is overwhelming. From time to time facts about the waiting-lists have been published, and however they may be interpreted, they are always disturbing. But there is now a general consensus of lay and official opinion that the time has come for a large expansion. The Town Council, under the new Local Government Act, is proceeding with the correlation of all its medical institutions; but this will not in any way interfere with the great appeal of the Royal Infirmary. To judge by the other Scottish hospital appeals, Edinburgh is likely to have a handsome response. It is not without significance that the 250th anniversary of the Royal College of Physicians comes next year, and, as the College was really the originator of the infirmary, the interest created by the anniversary will help the principal medical institution of the East of Scotland.

IRELAND.

(FROM OUR OWN CORRESPONDENT)

Cecilia-street School.

IT was announced last week that the last of the departments of the medical school of University College, Dublin, working in the old Cecilia-street School of Medicine, was finding accommodation in the college buildings in Earlsfort-terrace, and that the old premises—which had housed a medical school for almost a century—were about to be vacated. In 1836 the existing premises came into the possession of the Apothecaries' Hall, which there established a medical school. This had various vicissitudes, but about 1850 its fortunes dwindled, and a year or two later it was closed. The premises were then purchased by the recently established Catholic University of Ireland, and a medical school was again opened. It continued in full work until the establishment of the National University of Ireland in 1908, when it became the medical school of University College, Dublin, one of the constituent colleges of the University. Within the next few years most of the departments were transferred to the new college buildings in Earlsfort-terrace, and the transference will now be completed. The history of the school from 1859 to 1908 is one of great courage and zeal, overcoming almost incredible obstacles. The school was unendowed, and unable either to expand in space or to equip itself adequately, but during all these years it gave a sound training in medicine to successive generations of students, having sometimes on its books the largest roll of students attending any Dublin school. Its success was only possible by the self-sacrifice and devotion of a series of distinguished teachers.

Before the building of the first school by the Apothecaries' Hall the site had an interesting history. In 1259 it was granted to the Augustinian friars for their first monastery in Ireland, and they continued in possession until the suppression of the monasteries in 1539. The site was then granted to one Richard Nagle, the last Prior, who accepted the reformed faith. It passed through various hands during the next two centuries, and the house which replaced the old monastic buildings was at one time the office of the Down Survey, the first survey of Ireland, carried out in Cromwellian days by the famous Sir William Petty, the founder of the Lansdowne family. At this time the grounds were a physic garden owned by an apothecary named Wetherel, in whose house many of the early meetings of the Dublin Philosophical Society, now the Royal Dublin Society, were held. In 1731 a music-hall was built here, which some time later gave place to the famous Crowe-street Theatre, where Peg Woffington first appeared, and where Kean had some of his greatest triumphs. A few fragments of the fabric of the theatre are still seen in the building of the school.

Free State Medical Registration Council.

The vacancy in the direct representatives of practitioners on the Irish Free State Medical Registration Council was filled last week by the election of Mr. William Doolin. His election was unopposed. Mr. Doolin is a graduate in medicine of the National University of Ireland, and a Fellow of the Royal College of Surgeons in Ireland; he is one of the surgeons to St. Vincent's Hospital. He has been for several years honorary secretary of the Dublin Local Medical Committee. He has proved a very competent editor of the *Irish Journal of Medical Science.*

MEDICINE AND THE LAW.

Sale of Practice: Agent's Claim for Commission Fails.

IN the Greenwich County Court on May 7th a firm of medical agents unsuccessfully claimed £62 10*s.* in respect of the sale of a medical practice. It appeared that the defendant practitioner had at one time engaged an assistant through the agents. The assistant did not buy the practice but, when the services of a second assistant were required, he introduced a third practitioner who bought it, the new-comer being a personal friend. The plaintiff firm's case was that the defendant practitioner had asked them to find him an assistant who would ultimately buy the practice. The defendant practitioner's case was that the purchaser was not introduced by the agents but was procured independently. The purchaser gave evidence for the defendant. When he first came as assistant, he said, he had no idea of buying the practice; subsequently he himself volunteered the offer to buy. The county court judge accepted this evidence and found against the agents whose evidence, he said, was of the vaguest. The onus was upon the agents to show that through their efforts the sale was brought about. It seemed, however, that the sale was actually brought about quite independently of their efforts. All the agents did was to introduce an assistant; they never introduced the purchaser.

Details of the sale agreement were given during the case, the figures being required in order to justify the amount of the plaintiffs' claim. The price was £2850, including £1100 in respect of the lease. For some reason not readily apparent, the defendant practitioner was cross-examined as to his previous sales of practices. He explained that he left hospital in 1920, set up in practice for himself in the following year in an eastern district of Greater London, and presently sold his practice for £4000. In 1925 he worked up a practice nearer the centre of London which he sold for £1750 with £300 for the lease. He next went to a well-known suburb for two years where he disposed of his practice for £4000. Asked if this plan of building up practices, selling them and moving on elsewhere was usual in the medical profession, the witness replied that it was not unusual; it depended on the temperament of the practitioner; he thought more practices were established by squatting than by buying. The learned judge remarked that the transactions were perfectly legitimate. If the practitioner saw an opportunity of making a profit by sale, he was perfectly entitled to take advantage of it.

SEAMEN'S HOSPITAL SOCIETY.—The annual court of the Society was held at the May Fair Hotel on May 15th, with Admiral Sir Roger Keyes in the chair. Sir Arthur Clarke mentioned the work of the eight establishments for whose upkeep the Society is responsible, and said that the income this year, though £93,000, had fallen short of expenditure by about £2000. Sir Roger Keyes was glad to see present so many friends from overseas, evidencing the wide appreciation there was for the Society's work. The Belgian Ambassador spoke of the great pioneer work done by the Society in the study of tropical diseases, which his countrymen were now following in Antwerp. Dr. C. E. Sundell, senior physician to the Dreadnought Hospital, asked for further support to enable the Society to assist not only the seamen of the mercantile marine but also their wives.

ST. BARTHOLOMEW'S HOSPITAL.—The report for 1929 of the treasurer, Lord Stanmore, recapitulates the story of the great works of reconstruction that are in progress and the "striking and original propaganda" by which it is sought to raise the million of money that is required. It is pointed out that the ten new surgical wards are not an addition but a replacement of a similar number of old wards. The southern extension of Queen Mary's Home will be ready for occupation during the present month and will accommodate 51 nurses; the building will now have 321 sisters and nurses, but since there are 351 members of the nursing staff further accommodation is still necessary. The total income was £198,597 and the expenditure £197,660. The number of new in-patients was 9454, who stayed on an average 21·79 days; the new out-patients numbered 89,515. The hospital's small house property consists of 670 premises producing a gross rental of £49,426; the net receipts from this source, after paying rates, taxes, insurance, management costs, and repairs, were £27,838, or about 56 per cent. of the rentals.

THE FIRST INTERNATIONAL CONGRESS ON MENTAL HYGIENE.

(FROM A SPECIAL CORRESPONDENT.)

(*Continued from p. 1096.*)

Dr. HERMAN BOUMAN, Professor of Psychiatry and Neurology at the University of Amsterdam, spoke on

ALCOHOL AS A MENTAL HYGIENE PROBLEM.

He said that laboratory experiments had shown that even very small doses of alcohol injured the receptive functions—such as perception, memorisation, conception, and attention—in such a way as to cause the incidence of errors. As a result of the appearance of superficial associations without inner contact, the thinking faculty itself became incapable of serving as the basis of any higher mental life and degenerated.

It was important to observe that even in these conditions of slight intoxication self-criticism became less active, and the person tested had the subjective feeling that he had done his work much better than the experiment actually indicated. The result was, therefore, that less accurate perception and more superficial thinking were followed by hasty and inefficient action, which the person tested could not himself adequately criticise, because he had the illusion that he could do his work more easily and better than would be the case in a state of perfect sobriety.

Even very small quantities of alcohol produced a condition that had all the essential characteristics of delirium. The measures taken against alcoholism in the different countries and the organisation of the anti-alcohol movement had come into existence in quite different ways. The aim of an Act in Holland was limitation of "temptation" by restricting, so far as possible, the number of places where strong drink could be sold. This principle had proved sound. In 1877 the consumption of distilled drink per head of the population amounted to ten litres. In 1920 the number of litres per head of the population amounted to only 5·16. An important task remained—to take care of the drinkers who had to be set on their feet again. This was a difficult phase of mental hygiene work. It had been concluded that the best form of organisation for this purpose would be a group of "Consultation Bureaux for Alcoholism." The first bureau was established at Amsterdam in 1909, and since then these institutions had been formed in practically all the greater towns of Holland. In the bureaux a social worker and a psychiatrist shared the work. The bodily condition of the alcoholic was examined, and his mental aberrations, as well as his surroundings, his work, his family, his social behaviour. Though at first exclusively financed through private contribution, the consultation bureaux were now subsidised by the State, the province, and the municipality.

Under pressure of public opinion, the picture of alcoholism in Holland has undergone a gradual change. The admission figures for cases of alcoholism at the clinics have shown a slow but steady tendency to fall, and the mental hospitals have had fewer drinkers among those admitted. Crimes of violence have decreased, and there has been a reduction in the amount of alcohol used per head of the population.

Discussion.

Prof. WILHELM WEYGANDT (Germany) said that since the war alcoholic insanity and criminality had remained lower than in the pre-war years in Germany. This was no doubt partially due to the increased price of alcohol. The number of licensed houses was far too great in Germany; in some industrial towns it was as high as 1 to every 170 persons. He had no doubt that a large percentage of drinkers were psychically abnormal. There was a system of graduated control for alcoholics in Germany ranging from a warning with police probation to institutional care. He thought sterilisation desirable for the hopeless drunkard.

Dr. O. FOREL (Switzerland) said that Switzerland had a very high consumption of alcohol in relation to its population. There was not much organised propaganda against alcohol. In his view legal control on such a matter could never be successful. Negativism was a normal human reaction and any laws to be effective must have the full support of public opinion. Temperance propaganda throughout the world had not so far been carried out with due regard to the psychology of the public. The temperance reformers had been too severe, too superior, and too dogmatic.

Prof. JAN PILTZ (Poland) said that the campaign against alcohol was a question of national efficiency and should be one of the first planks in the platform of mental hygiene.

Dr. W. TREADWAY, of the Public Health Service of the United States, declined to be drawn into a discussion on prohibition. He said that the various articles and reports on the subject would be available to members of the congress.

Dr. DORIS ODLUM (England) spoke of the reduced consumption of alcohol in England since the war. There was a certain amount of regulation of the sale of liquor, but the decrease in drunkenness was largely due to the raising of the standard of living. The question of housing was important in this connexion. The results of experiments in removing slum dwellers into special houses had been extremely satisfactory. The claims of temperance were best promoted by raising the standard of living and by the education of the public in the sense of social responsibility.

Prof. E. RÜDIN, head of the Genealogical Department of the German Research Institute for Psychiatry (Kaiser Wilhelm-Institut), Munich, read a paper on the

SIGNIFICANCE OF EUGENICS AND GENETICS FOR MENTAL HYGIENE.

He said that eugenics investigates how a human being may, with the greatest probability, be brought into the world without unfortunate mental or physical hereditary tendencies. Expressed in terms of social economy, therefore, eugenics means an enormous saving of useless, or partially unsatisfactory, mental hygiene. Prof. Rüdin supplied statistics obtained mostly from personal investigations in his own institution to give an idea of the significance of heredity in the transmission of mental diseases.

If one of the parents is afflicted with Huntington's chorea 50 per cent. of the children will have the same hereditary disease, and the same proportion of the children of parents with dementia præcox or schizophrenia will be mental defectives. If one of the parents is afflicted with manic-depressive insanity fully 33 per cent. of children will be manic depressives, and at least as many will be otherwise mentally abnormal. A large proportion of the children of genuine epileptics are also afflicted, and, as in all hereditary mental disorders, a still greater proportion when the other parent also is not quite normal. Reviewing the anxieties and doubts besetting individuals afflicted with disease who wished to mate, and the methods available for preventing hereditary disease, he believed that voluntary sterilisation (not castration) of the hereditarily diseased or hereditarily defective should be considered, not only because it was statistically, but also because it was individually, absolutely and permanently reliable. It entailed no danger to physical or mental health, nor did it encroach upon the habits of life and the pleasures of life in any way, and would not, if suggested with tact and consideration, produce any psychic trauma.

It was a consoling fact that exactly as diseases and defects were transmitted, so were the tendencies to positive qualities such as talent, and to foster these, thus increasing the public heritage, was one of the chief duties of mental hygiene.

In the course of the discussion Prof. JOUCHTCHENKO (Russia) said that he agreed with Dr. Rüdin on the importance of preventing the reproduction of hereditarily diseased or defective stock. The laws of heredity were not yet fully understood, and it was therefore important to preserve an open mind until more scientific data on the subject were available.

Dr. FRANS ALEXANDER (Berlin) read a paper on

MENTAL HYGIENE AND CRIMINOLOGY.

He said that the form of the question, "Why does a person become a criminal?" was due to lack of knowledge. It presupposed that it was natural to

be a righteous citizen and that a special explanation was necessary when people did not respect social regulations. Psycho-analysis, on the other hand, taught that people come into the world with impulses and instincts that were not adjusted to society, and that they were born as criminal beings in this sense, that if a little child could realise the demands of its instincts it would act as a criminal. The entire development of the instincts of the child from the age of 4, 5, or 6 on consisted of a gradual adjustment of the demands of the instincts to the demands of society—a development that no human being finished entirely successfully. The right form of the question was "Why do not people in general become criminal?" or rather "Through what processes of development does the originally asocial child turn into a social being?"

He differentiated between the chronically criminal, whose treatment belonged to the doctors, and the accidentally criminal, who could be influenced by a change of environment. The tendency to criminal instinctual outbreak was acquired in the indecisive instinctual conflicts of childhood. In this field it appeared that the two great instinctive qualities that had to endure the disturbances of the equilibrium between renunciation and satisfaction were hunger and love. As in other branches of the study of human beings, the sexual factor has been greatly neglected in the study of criminology up to the time of Freud. Our judges still tried to explain every human action by consciously rational motives. To them every phantastically construed motive was preferable to the general instinctive-emotional motive which in fact generally determined any action. The behaviour of the psychopathic or chronic culprit betrayed a clearly irrational trait. It could not be explained by a utilitarian motive; this was the difference between the kleptomaniac and the common thief. The second distinguishing symptom of chronic criminals was their stereotyped form of behaviour. The unconscious demands of instinct conquered without any regard for the experiences of the past or for the present situation, and always in the same manner. The third symptom was psychic conflict. Remorse and condemnation of the act came, but too late; even if conscious condemnation of the act was lacking, unconscious expressions of condemnation were found in the form of self-harmful tendencies. The sick man, that is, the culprit, was mostly an intelligent, often talented man, pleasant, universally beloved, a man who, as if driven by an evil spirit, from time to time committed acts quite contradictory to his character. Behind the myth of the evil spirit lay a true observation; the demon was in this case the powerful, compulsively conquering unconscious. While punishment and threats of punishment might have a terrifying effect upon normal law-breakers, who acted with conscious deliberation, all such measures had the exactly opposite effect upon the neurotic culprits, because they had no approach to the unconscious. Because of the ever-present need of punishment felt by the culprits, threats could even lure them to commit the deed. The punishment endured was the very thing to break down the moral repressions of these people, to lessen their sense of guilt, and to encourage them to new offences. This was the explanation of the obstinate tendency of this group of law-breakers to relapse. Nor was change of environment of any avail. Improvement of the outward conditions of life increased the feeling of guilt, strengthened the need of punishment; the tragic mentality of these people made them liable to commit new crimes just after an improvement in their circumstances. Psychopathic culprits belonged to medicine. The aim of treatment was to make conscious the unknown motives. Only after the control of the conscious ego had been extended over the life of the instincts was it possible to expect restraint of the criminal impulses and to prevent relapse.

Admittedly, however, a certain discontent was characteristic of the civilised man in general, and this discontent—recently called by Freud "discomfort of civilisation"—was relatively independent of mental disease and social position. The increasing organisation of society forced man to an adult life in a higher degree than he could live, and neglected his childish demands. There was an increasing control of the principle of utility and a decreasing of the principle of pleasure. Our mechanical economic civilisation showed this to an extent never before reached. The result was a damming up of the playful, irrational pleasure-seeking formerly associated with human occupations and social activities. This increased the conditions for neurosis and for crime, if at the same time new outlets were not found. In Dr. Alexander's view the most important social problems of future mental hygiene was the development of such outlets.

Dr. V. V. ANDERSON, Director of Employment, Placement and Personnel Research at the Macy department store in New York City, spoke on the

CONTRIBUTION OF MENTAL HYGIENE TO INDUSTRY.

He said that in the department store to which he was attached about 20 per cent. of the employees were what might be called "problem" individuals, and this was probably true of other business and industrial organisations. This group of persons were either liabilities or potential liabilities to the business man; from it were drawn the repeated transfers from job to job, the resignations and the dismissals.

Nineteen per cent. of the salespeople and 23 per cent. of the non-salespeople gave rise to situations that caused their department heads to question the value of their services to the store. As the psychiatrist saw these individuals, they presented distinguishing physical and mental characteristics. He was impressed with three outstanding causative factors: (*a*) a maladjusted personality; (*b*) specialised job disabilities; (*c*) faulty physical conditions. As the employer saw them, they were production problems, or chronic health problems, or chronic attendance problems, or disciplinary cases—and from his point of view he was better off without them. From the medical and mental-hygiene point of view, however, many of these individuals might, through treatment, be adjusted and become assets to the employer, thus cutting down turnover among employees and increasing production efficiency. The records at the Macy store showed a sufficiently large number of improvements under psychiatric treatment to make the application of such measures profitable, not only in terms of human salvage, but in terms of dollars and cents. Of the last 500 problem cases, 67 per cent. were still in the store, 23 per cent. had been dismissed, 8 per cent. had resigned, and 2 per cent. were pensioned. Of the active cases, 40 per cent. had been adjusted and were no longer problems to their departments, and 44·7 per cent. were still under treatment.

Every department head had tried various methods of dealing with such employees—fatherly lectures, additional training, transfers, and finally dismissals. There could be no denying that it paid in time, money and energy to have each of these employees adequately studied before wasting energy on such methods. As a result of psychological tests and other methods of picking automobile drivers more carefully, driving accidents in the firm had been reduced by 50 per cent.

Mrs. SIDONIE MATSNER GRUENBERG, Director, Child Study Association of America and Consultant in Parent Education of Columbia University, spoke on the

SIGNIFICANCE OF THE HOME IN THE PERSONALITY AND CHARACTER DEVELOPMENT OF THE ADOLESCENT.

She said that during the development from infancy through the subsequent stages of growth, the home stood out as the most important single influence. To-day many are familiar with some of the emotional motives of this family drama, especially the emotional states of the parents in relation to their adolescent children: the mother seeking a husband substitute in her son; the father seeing the mother image in his daughter; parents everywhere hoping to relive or to perfect their own lives through the lives of their children. Thus they centred about their sons and daughters conflicts growing out of their own social strivings, their money strivings, their love strivings, and because of these too often imposed upon their children false standards and expectations. The resulting tensions and fixations were stumbling-blocks to normal growth from the earliest childhood years, but it is in adolescence that they took their most visible toll.

Until very recently this family drama had gone on behind closed doors, and parents were still inclined to resent inquiries from any outsider about what happened in the home. Until recently it had been taken for granted that

with the moral and psychic health of their children parents must struggle alone, although it had long been respectable to seek expert advice in the prevention as in the cure of physical disorders. The modern home had lost certain educational and disciplinary opportunities which existed before the introduction of labour-saving improvements—the discipline of disagreeable but *indispensable* service, the challenge to ingenuity and invention, the daily exercise in adaptability. A good housewife formerly maintained her status and perhaps also her self-respect even if she proved to be a rather incompetent guide for her children; to-day if she failed as a mother she could not fall back upon compensating virtues as cook or laundress. With the father economic competence was still basic, but both parents were coming more and more to be judged by the relationships that they succeeded in maintaining between the constituent members of the home. Although most of their own work had been taken out of the home, parents still influenced children through their reactions to their own standardised drudgery. If children grew up seeing only the disagreeable aspects of the life of labour, aspirations would naturally turn toward means of escape, or the outlook would become one of resignation and dull indifference. The maturing process of the modern child was apt to be delayed by the lengthening of the period of schooling and the consequent freedom from economic obligation. The very unreality of high school and college life artificially prolonged childhood. The allowance and the opportunity to earn should thus be a part of every child's experience. Boys and girls especially at school and college were appallingly unaware of alternatives, almost totally innocent of experience in the making of choices.

It was most important for parents to recognise and to accept, in their own attitudes and their explicit teachings to their children, the fact of a changing order. Many of the deep convictions of yesterday turned out to be parochial customs for which the rest of the world to-day has but a smile of patronage. The same was true of our attitudes toward sex. There remained in our civilisation vital functions which the home—and the home only—could fulfil.

Miss EVELYN FOX, Hon. Secretary, Central Association for Mental Welfare, Great Britain, spoke on

COMMUNITY SCHEMES FOR THE SOCIAL CONTROL OF MENTAL DEFECTIVES.

She said that while every civilised country was making efforts to provide schools and institutions for some of its mental defectives, little had been done toward establishing a system of social service that would be available for all defectives living in the community. She outlined the principles on which such a service should be based. The only really satisfactory criterion of mental deficiency was the social one, and if a person suffered from a degree of incomplete mental development which rendered him incapable of independent social adaptation and which necessitated external care, supervision, and control, then such person was a mental defective. That was the definition given in a recent British Government report. For purposes of training defectives could be divided into two groups: those who must be sent to institutions and those who could be trained in their own homes or by foster parents. The training outside an institution was, in Miss Fox's view, preferable for both imbeciles and feeble-minded of a stable temperament who appeared capable of being controlled and occupied, given a good type of home and intelligent parents or foster parents. Under these conditions, the defective in the home had opportunities of meeting and surmounting everyday difficulties, of adapting himself to varied surroundings, of being thrown with the same people he would meet in later life, of growing up in the same world to which he must later fit himself. The statement was made over and over again in all countries that imbeciles should be trained in institutions. Experience in England had shown that imbeciles and low-grade feeble-minded children with decent homes and in attendance at occupation centres could be successfully trained, and that the possibilities of their social adaptation were at least as great as for those trained in institutions.

Dr. GEORGE S. STEVENSON, Director of the Division on Community Clinics of the National Committee for Mental Hygiene, discussed

THE CHILD-GUIDANCE CLINIC: ITS AIMS, GROWTH, AND METHODS.

He said that the child-guidance clinics now in existence had been created largely within the past ten years. It was their purpose to treat the behaviour disorders of children, such as tantrums, stealing, seclusiveness, truancy, cruelty, sensitiveness, restlessness, and fears. The aim was to produce a more efficient, productive, and harmonious adult and a healthy mental life during the period of development. The clinic worked largely with the pre-school child and his parents, since parental ignorance and early habits and attitudes were major contributors to the behaviour problems of childhood. The clinic maintained a threefold staff, psychiatrist, psychologist, and psychiatric social worker.

The first child-guidance clinic was initiated in 1909 by Dr. William Healy in Chicago. In 1922 the Commonwealth Fund launched its programme for the prevention of delinquency and carried on a five-year term of demonstration and experimentation, and since then the movement had grown at a great rate. The Commonwealth Fund had also created a national bureau for child-guidance work, being the Division on Community Clinics of the National Committee for Mental Hygiene. This bureau coördinated the work of existing clinics and assisted in the planning of new ones. To-day there were about 500 clinics in the United States giving psychiatric service to children. Only about a quarter of these, however, which had a threefold staff, should be considered child-guidance clinics.

Of the 25 outstanding child-guidance clinics, nine were supported by the Community Chest, a coördinating and money-raising organisation for all the social agencies of a community. Practically all child-guidance clinics accepted responsibility for community education in the mental hygiene of childhood. Few community groups, social or industrial, had taken advantage of those reliable mental hygiene facts that could aid them in their jobs. Parents, of course, had the broadest needs. But there were also professional groups—the court, the school, the social service agency, the church, and the doctor—who were daily being given the more serious problems of the children of the community to deal with or advise about. These groups could use the experiences of child-guidance clinics to serve their own clients and patients. The appeal of the work of the child-guidance clinic was such as to tempt unprepared persons to undertake it. Behaviour problems of children could be dealt with by others than psychiatrists, but such work was satisfactory only when the contribution of the pyschiatrist to the more complex cases and the importance of the physical condition in all cases were recognised and actually influenced the procedure.

There was a decided shortage of persons to fill positions in child-guidance clinics. At the present time there were attractive positions vacant for psychiatrists. This shortage was the result of inadequate psychiatric education in our medical schools and the lag that appears between demand and supply due to the time required for training. A similar problem existed in respect of psychiatric social workers, but the training centres for child guidance were rapidly increasing.

Dr. OTTO KAUDERS, Assistant, Clinic for Psychiatry and Neurology, University of Vienna, spoke on

SEX AND CIVILISATION.

He discussed the adjustments required between the individual and the community. Human civilisation must ask from each of its participants not only the resignation of the satisfaction of a part of his sexual desires and of his possibilities of sex experiences, but also the resignation of the satisfaction of a great part of his ego, of his instinct for self-preservation, of his desire for power.

Mental sex hygiene did not pretend to influence in a decisive way the special individual laws of cultural development that stamped the sexual life of the time. But while it endeavoured to intervene objectively, investigating and helping practically, in all important points of contradiction and agreement

between civilisation and sex, its ideal purpose was to bring the impulsive human being into harmony with his just desires for sexual happiness and also with civilisation, whose servant it was his duty to be.

MANCHESTER MEDICAL SOCIETY'S LIBRARY.

A GIFT TO THE UNIVERSITY.

THE Manchester Medical Society has given its valuable library to the University, and this transfer of ownership is a landmark in the scientific life of the town. It settles a problem which has been a recurring source of discussion in the local medical world in cycles of about ten years—namely, the possibility of forming a medical institute in the town and removing a big library to it. Founded in 1834, the Medical Society had its quarters in the centre of the town until 1874 when they were moved to the new buildings for the medical school of the Owens College. The college undertook to house the library and to find the necessary accommodation for a reading room and meetings, and to contribute an annual sum for privileges to its staff for use of the society's books and periodicals. This arrangement has been in existence until the present day. The society's library has grown from 1075 to 35,000 or more volumes, and besides these the university has, in the library, another 20,000 volumes purchased out of its own funds or received by gifts, the chief of which were the libraries of the Manchester Royal Infirmary and the St. Mary's Hospitals, each about 7000 volumes. Both these libraries occupied space in the hospitals which was urgently needed for other practical purposes. The cost of maintenance of libraries has greatly increased in recent years because of the price of books and periodicals, and of the latter especially the first-class German journals. Unfortunately the society's income has not grown in like manner and is nearly stationary. The subscription has only been one guinea, attempts to double it having failed owing to the average practitioner not appreciating the value of such a library. The society, therefore, has found itself unable to bear the burden of responsibility for maintaining the library in spite of a large grant from the university. Whilst the library provides many books of interest for its ordinary members it is especially valuable for research, and to facilitate this small sub-libraries in anatomy, physiology, therapeutics, and gynæcology have been formed in these departments. It was felt that such a library could never be moved from the centre of research, whatever developments there might be in a scheme for a central meeting place for all the scientific societies of the town. Hence the decision, after anxious deliberation over several years, for the step which has just been taken. The university now owns the library and undertakes its maintenance with a definite annual contribution from the society, in return for which the members of the society have all the rights of use that were asked for and also access to the large general Christie library of the university.

The Medical Society's library contains information of inestimable value to the scientific research worker, and to the would-be medical historian. There are many rarities on its shelves. There are a dozen incunabula, the earliest dated work being 1480 from a Venetian press of an Italian translation of Guy de Chauliac's "Chirurgia Magna" which was the text-book of surgery in several languages until beyond the sixteenth century. Only two other copies of this work are known. There are close on 600 books printed by foreign presses before 1600, 200 being dated before 1550. Fine copies of early editions of all the classical writers in medicine, many in Latin or Greek, are on the shelves, and book-lovers will be delighted with the study of those from the Aldine and Elzivir presses. There are 150 copies of English printers' work before 1675, and 250 before 1700. The earliest dated book in English is a Herbal, 1548, the author of which is not stated and of which no other copy is known in libraries. Bound up with this, which is in black letter type, are four other tracts in similar type, one being "The Myrrour or glasse of helth," by Thomas Moulton—a "Doctour of dyvynytie," and chiefly concerned with advice about avoiding the plague as derived from the influence of the planets on health and disease. The library has been added to by gifts from its members—a special lot of many hundreds being left to it by the late Dr. Percy Cooper. A new feature of it is a collection of all information of local medical historical value, biographies, portraits, hospital reports. Anything of this nature will be gladly accepted by the library from our readers.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some 1929 statistics of two county boroughs, one rural and one urban district:—

Name of district and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Reading C.B.. (97,050)	14·9	14·1*	1·26	1·57	3·3	1·4	50/27	32	2·8
Bootle C.B. .. (80,400)	20·6	13·6	1·34	1·21	3·7	1·3	83/34	64	3·0
Barnstaple R.D. .. (18,540)	13·8	12·0	0·81	1·56	1·6	2·1	78/—	—	3·9
Ventnor U.D.. (4,982)	11·2	16·0	0·60	3·00	2·4	3·2	71/—	36	0·0

* Standardised, 12·2.

Registered stillbirths per 100 live births: Reading, 3·7; Bootle, 3·9; Barnstaple, 3·5.

Reading.

Dr. H. J. Milligan reports that the birth-rate is the lowest ever recorded in the borough. He thinks we are approaching a time when the birth-rate will not exceed the death-rate, and the natural increase of population will cease. The death-rate is higher than any recorded during recent years and this increased mortality was the result of adverse weather conditions and the unusually severe epidemic of influenza which prevailed during the earlier weeks of the year. The mortality from influenza was greater than in any year since the pandemics of 1918 and 1919. There was the usual concomitant increase in the deaths from bronchitis and pneumonia, which were nearly double the normal annual average. Further, there was an increase in deaths from pulmonary tuberculosis, which was probably associated with the prevalence of influenza. The infantile death-rate was lower than any hitherto recorded, and would have been still more favourable but for the unusually large number of infant deaths from pneumonia during the influenza epidemic.

The borough council has adopted a scheme which will not only meet the immediate requirements of the Local Government Act, 1929 (which came into force on April 1st, 1930), but will provide in large measure for the further development of the services concerned. The council has appropriated Battle Infirmary, and this involves the disappearance of the term "pauper" in so far as it has been applied to sick persons in the infirmary. The council will also be enabled to effect a closer coördination between all

the resources available for the care of the sick and the prevention of disease, as an object apart from the relief of destitution. The records at the V.D. clinic now differentiate between recent infections of syphilis and the later manifestations of the disease, and it is found that new cases of recent syphilitic infection are not numerous. There were only nine such during 1929. On the other hand, there has been a definite increase in the cases of gonorrhœa treated which numbered 79 in 1927, 112 in 1928, and 160 in 1929. The maternity and child welfare work continues to grow and the attendances at centres have increased from 11,000 in 1920 to 28,000 in 1929. Of the 21,386 home visits paid by the health visitors 11,778 were in respect of children aged 1 to 5. The shortage of houses for the working-classes has not been overcome and the housing committee have been unable to rent alternative accommodation for displaced tenants of condemned houses. The committee have, however, made arrangements for the erection of 2000 houses at Whitley. There are still about 2000 applicants for municipal houses and during 1929 an unusually high proportion of the patients admitted to Dellwood Maternity Home were living in rooms. The tuberculosis officer also draws attention to the difficulty in obtaining suitable housing accommodation for tuberculous patients living under unsatisfactory home conditions. Despite all this some progress has been made in closing unhealthy houses and 38 out of 107 houses scheduled for closure have been dealt with during the year.

Increasing attention is being given to the purity and cleanliness of articles of food prepared for sale. There was only one prosecution for the exposure of unsound food for sale and no prosecution under the Sale of Food and Drugs Acts. It seems, however, that the position as to tuberculous milk is not so satisfactory. During 1929 two out of 37 samples were found to be infected, and during the last ten years 27 out of 248. Ten per cent. of the non-designated and unpasteurised milk sold in Reading may thus be expected to contain living tubercle bacilli. The deaths from violence show an increase. Thus there were 64 such deaths during 1929, including 20 suicides as compared with eight or nine in previous years. Dr. Milligan draws attention to the fact that the conditions of life and the prospects of the practice of midwifery are not such as to attract the best members of the nursing profession, and supports his opinion with an analysis of the earnings of the midwives in Reading. The rainfall in Reading during 1929 was remarkable. There were only 21·7 inches as compared with an annual average of between 25 and 26 inches, and of the 21·7 inches 6·33 fell in November and 5·16 in December.

In the school report it is mentioned that through the enterprise of the teachers 22 per cent. of the scholars receive half a pint of milk during the morning session. Increased attention is being given to the teaching of hygiene and the subject now has a definite place in the syllabus of practically all the schools. The erection of the new school clinic will facilitate dealing with the arrears in dental work. A special memorandum by Dr. Agnes Bernfeld, who conducts the ear, nose and throat clinic, will be read with interest by all school medical officers, as it contains a description of the technique of the treatment originated by Dr. Gautier (named by him "diastolisation") and the results obtained by this treatment in Reading during the last two years.

Bootle.

Dr. F. T. H. Wood reports that the birth-rate is lower than ever before, that the increased death-rate was due to influenza and severe cold in the first quarter of the year, and that the tuberculosis death-rate continues as in 1928 to be the lowest yet recorded in the borough. A noteworthy event has been the taking over from the Bootle Health Society of control of the maternity and child welfare clinics. For the purpose the medical and nursing staff has been strengthened, and two additional antenatal clinics have been established and a beginning made with postnatal supervision of the mother. The new cases at the antenatal clinics numbered 35 per cent. of the total births. Invitations were given to the expectant women attending the clinic to return six weeks or later after confinement for examination; 42 women accepted the invitation, and of these 22 were found to be suffering from morbid conditions requiring treatment and 5 of them were referred for admission to hospital. The child of pre-school age is to receive increased attention and the additional staff and clinic provision enabled 332 such children to be dealt with. It is hoped to extend this work during 1930 and to make further use of the specialist clinics of the educational committee for conditions such as squint, ear discharge, and crippling defects. The improved facilities at the council's new V.D. centre at the Bootle Borough Hospital have resulted in a great increase in the attendances. Of 70 new cases of syphilis 31 had contracted the infection more than 12 months before attending. It is pointed out that the increased work and attendances is not due to a greater prevalence of the disease.

A few years ago municipal building activities were increased. Thus the council erected 74 houses in 1926, 182 in 1927, 305 in 1928, and 346 in 1929. The limit of the needs has, however, not yet been reached, for in March, 1930, there remained 830 of the applications previously tabulated and 625 new ones. A small unhealthy area covering 1·02 acres and containing 69 houses has been represented. Progress is being made with plans for a new health centre in the north of the town to accommodate tuberculosis, maternity and child welfare, and education committee activities. The passing of the Local Government Act, 1929, is being utilised to secure as complete coördination as possible of the new and the old medical services. The medical officer of health is also medical officer to the public assistance committee. Deaths from violence numbered 42 and included 11 from suicide. In 1928 45 out of 175 milk samples were found to be adulterated. During 1929, 45 informal and 91 formal milk samples were taken. Of the 91 formal samples 14 were adulterated. Two vendors were fined for selling milk containing added water to the extent of 4 to 5 per cent., while a third was withdrawn on payment of the analyst's fee. Three vendors were fined for selling milk deficient in fat, 31 per cent., 17 per cent., and 8 per cent. respectively. In 6 cases of slighter adulteration the vendors were cautioned. There was one appeal to the cow and one purveyor was fined for refusing to sell to the inspector. The analyst reports that the average of fat in all samples including those adulterated was 3·64 per cent. and of non-fatty solids 8·85 per cent.

Good results are being obtained at Linacre Hospital in suitable cases from artificial pneumothorax. One patient so treated in 1924 has been at work full time ever since. Another first treated in 1925 is now working full time. A third first treated in 1928 has now no symptoms. All these were well-established cases with tubercle bacilli in their sputum.

Barnstaple.

Dr. J. R. Harper notes that the standard of living of the labouring class in his rural district has been improved. Wages have increased, new and more healthy cottages are available, and existing cottages have been reconditioned under the Housing (Rural Workers) Act, 1926. During 1929 the reconditioning of 20 houses was completed and since the Act came into force 49 schemes have been approved. The county council makes hospital provision for smallpox, but Dr. Harper stresses the need for a hospital for other infectious diseases in this area. An important event during the year was the completion of the Combemartin water-supply scheme.

Ventnor.

Dr. R. T. Cooke reports that the urban district council in November agreed to purchase the water undertaking. He remarks that the yield of water at the source is sufficient to ensure the town's popula-

tion a constant supply but that the efficiency of distribution is open to question. The aggregate of bright sunshine for the year taken at the hospital was 2068·6 hours and Ventnor is said to come out best of the 12 stations which send in 12 consecutive monthly returns of ultra-violet light. The sanitary inspector reports that in 1926 the council purchased a housing site for £650 and accepted three contracts for 20 houses, two of which have been completed and the third is well under way. The houses are of the parlour type and of four designs. The cost varies from £460 12*s.* 5*d.* to £499 15*s.* per house.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 10TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox 462 (last week 306), scarlet fever 1991, diphtheria 1303, enteric fever 85, pneumonia 944, puerperal fever 50, puerperal pyrexia 107, cerebro-spinal fever 25, acute poliomyelitis 3, acute polio-encephalitis 1, encephalitis lethargica 17, dysentery 7, ophthalmia neonatorum 117. No case of cholera, plague, or typhus fever was notified during the week.

Of the cases of small-pox, 222 were returned from the County of London—namely, Bermondsey 3, Bethnal Green 41, Camberwell 27, Deptford 2, Finsbury 5, Hackney 21, Hampstead 1, Holborn 1, Islington 12, Kensington 2, Lambeth 3, Lewisham 4, Poplar 27, St. Pancras 4, Shoreditch 34, Southwark 4, Stepney 25, Stoke Newington 5, Woolwich 1. Outside London small-pox was reported from 15 counties—namely: Derby 3, Durham 3, Essex 50 (of these West Ham 21, Walthamstow 10), Kent 5, Lancaster 13, Leicester 61, Middlesex 16 (of these Tottenham 11), Nottingham 3, Stafford 21, Warwick 1, Wilts 2, Yorks, West Riding 36, Brecknock 4, Glamorgan 14, Monmouth 8.

Of the number of cases in the Infectious Hospitals of the London County Council (the name Metropolitan Asylums Board has disappeared) on May 13th–14th was as follows: Small-pox, 568 under treatment, 22 under observation (last week 548 and 33 respectively); scarlet fever, 2004; diphtheria, 2471; enteric fever, 33; measles, 965; whooping-cough, 60; puerperal fever, 26 (plus 18 babies); encephalitis lethargica, 119; poliomyelitis, 1; "other diseases" 21. At St. Margaret's Hospital there were 18 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 99 (42) from measles, 9 (3) from scarlet fever, 27 (3) from whooping-cough, 49 (16) from diphtheria, 45 (7) from diarrhœa and enteritis under two years, and 33 (5) from influenza. The figures in parentheses are those for London itself.

The fatal case of enteric fever outside London was reported from Birmingham. Fatal cases of measles have dropped below the hundred line for the first time for many weeks: Southampton reported 7, Warrington, Salford, and Rochdale each 4. Birmingham and Liverpool each reported 4 fatal cases of whooping-cough. Six deaths from diphtheria occurred at Liverpool, 4 at Cardiff. Diarrhœa was credited with 6 deaths at Manchester and 4 at Liverpool.

The number of stillbirths notified during the week was 292 (corresponding to a rate of 39 per 1000 births), including 56 in London.

DEATH FROM SMALL-POX.

THE death assigned to Finsbury (Met. Boro.) in the Registrar-General's return for the week ended April 26th was that of a male infant, one month of age, who died at Joyce Green Hospital on April 2nd, the death certificate being filled in thus: Small-pox: pyæmia. Not vaccinated until after exposure to infection. No P.M. The father, Dr. A. E. Thomas tells us, was a commercial traveller, and the infant was sent into hospital with his mother, who had had small-pox for some time undetected. The mother's rash appeared on forehead and wrists on March 18th. On the 28th mother and child were removed to the South Wharf Hospital, and from there to Joyce Green. The baby was being breast-fed throughout and was vaccinated on the day of removal to hospital when he showed no signs of small-pox. These developed after admission to hospital. He was presumably infected by the mother prior to admission.

Correspondence.

"Audi alteram partem."

VITAMIN A AND INFECTIONS.

To the Editor of THE LANCET.

SIR,—I wish to express my concurrence with the views expressed by Dr. A. H. G. Burton and Dr. A. R. Balmain in their paper published in THE LANCET of May 17th (p. 1063) that vitamin A has no anti-infective effect in the sense of Mellanby and Green—namely, that it cannot prevent such an infection as puerperal septicæmia, nor can it cure such a septicæmia once it has been established. The experimental evidence is entirely in agreement with their clinical observations. Since previous observations have not been fully taken into account in the papers by Green and Mellanby, it may be useful to summarise the outstanding facts.

1. Animals kept on a vitamin A deficient diet are particularly susceptible to develop spontaneously infections of a chronic nature by organisms which are not very virulent.

2. The organs which are earliest and most frequently infected are the lungs and intestine (McCarrison,[1] Cramer[2]).

3. In the mucous membranes of these organs it has been shown that there is an atrophy of the mucous secreting cells and that the intestinal bacteria penetrate into the lumen of the glands of the altered intestinal mucous membrane, where they proliferate. Figures illustrating this process have been published in your columns.[2]

4. Animals kept on a vitamin A deficient diet do not differ in their immunological reactions from normal animals nor are they more susceptible to infection by virulent or avirulent pathogenic organisms, when these are introduced experimentally by subcutaneous injection (Cramer and Kingsbury[3]).

From these observations it seems justifiable to conclude that an adequate supply of vitamin A is necessary to maintain the mucous membranes in a state of full physiological activity, one of their functions being to prevent the bacteria normally inhabiting the lumen of the respiratory and intestinal tracts from penetrating into the body. A deficient supply of vitamin A impairs the functional activity of the mucous membranes with the result that the bacteria are allowed to penetrate into the mucous membranes to proliferate there and to produce a toxæmia. From there they may eventually penetrate into the blood stream, and after having exhausted the humoral defences of the body, set up metastatic infections elsewhere.

An adequate supply of vitamin A is therefore a powerful physiological prophylactic against infections entering by the mucous membranes. It may possibly be of therapeutic value also in the treatment of some chronic intestinal toxæmias and of chronic infections of the respiratory and intestinal tracts, especially where these have been associated with defective nutrition. But that has yet to be demonstrated. There is no evidence, however, that vitamin A can cure infections once the barrier of the mucous membranes has been passed or that it can prevent or cure those infections which enter by the blood stream or by the subcutaneous tissues, as they do, for instance, in puerperal septicæmia. To call vitamin A an "anti-infective" vitamin is as much a misnomer as to call it a "growth promoting" vitamin. It seems unwise to exaggerate the extent of its real action and to make claims for it which cannot be realised. Disappointment is sure to follow. This will discredit the more limited though really effective action of vitamin A of

[1] McCarrison, R.: THE LANCET, 1922, i., 208; and numerous other publications.

[2] Cramer, W.: THE LANCET, 1923, i., 1046; ibidem, 1924, i., 663.

[3] Cramer, W., and Kingsbury, A. N.: Brit. Jour. Exp. Path., 1924, vi., 300.

maintaining the physiological defences of the mucous membranes, which are the portals of entry of most infections in man.

I am, Sir, yours faithfully,
W. CRAMER.

Imperial Cancer Research Fund, London, May 17th, 1930.

ANGINA PECTORIS AND CORONARY DISEASE.

To the Editor of THE LANCET.

SIR,—I am grateful to Dr. Poulton for referring me to his Oliver-Sharpey lectures on visceral pain. I had forgotten that in them he dealt with angina pectoris, and I must apologise for criticising his theory of myocardial distension without reference to the whole of the evidence he adduces in its favour. I have now re-read his lectures carefully and with great interest.

In his letter he protests against my regarding myocardial anoxæmia as an alternate explanation to myocardial exhaustion or myocardial distension. I am unrepentant. It is only a half-truth to say that the heart muscle is exhausted in angina pectoris, but to say that the heart muscle is distended is to go far beyond the available evidence. The theory of myocardial anoxæmia offers a half-way house where the cautious student may, for the moment, rest, satisfied that he will not have to retrace his steps. I am, of course, aware that this theory provides no explanation of the actual pain mechanism, and I made no attempt to deal with this part of the subject in my article.

As for my objections (*a*) and (*b*). Dr. Poulton himself characterises the evidence in support of his theory as scanty and I have no desire to use a harsher adjective. I think that all the facts he gives in his lectures might be used to support a contrary theory. Take, for example, the case of acute left-sided failure which he and Dr. Campbell so ingeniously investigated. Dr. Poulton believes that the pain was due to stretching of the pain nerve-endings in the right side of the heart. It might equally well have been caused by raised tension in the left side of the heart owing to an inadequate relaxation of the muscle in spite of increased diastolic pressure or by raised tension in the right side due to exaggerated muscular contraction again with increased diastolic pressure. My own opinion (for what it is worth) is that the pain of angina is produced by an anoxæmia of the myocardium which results both in failure of the muscle-fibres to relax adequately and in exaggerated muscular contractions with consequent raised tension and stimulation of pain nerve-endings. Dr. Poulton's theory is, I believe, the correct one for other types of cardiac pain. It is interesting to observe that all these three factors—anoxæmia, imperfect relaxation (retraction), and exaggerated contractions are present in uterine pain in labour, but not in the painless contractions of pregnancy.

Objection (*c*). I was not aware of Dr. Anrep's work on amyl nitrite; I hope he will publish it so that it may be confirmed by the pharmacologists. It is unfortunate that neither Dr. Poulton nor I can be certain either of the clinical or of the experimental action of nitrite; if we could it would settle these problems.

Objection (*d*). Here Dr. Poulton misunderstands me, and probably it is my fault. When I wrote that there is no condition occurring in the stomach or œsophagus which is at all comparable to angina pectoris I was thinking only of primary angina pectoris, and I meant that there is no known syndrome in these organs in which there is clinically pain referred to the appropriate segments and pathologically, decay of the arteries supplying them. Now when one considers the difference in function between the heart and the gut would one expect to find such a syndrome.

The viscero-sensory reflex which, after Mackenzie, is best called secondary angina, may be initiated in the higher level of the brain, as in the neurasthenic, or in the lower level of the brain, as in the so-called "vaso-vagal" attacks which occasionally occur in epilepsy, or in any organ in which there is a septic or toxic factor, as in Mackenzie's well-known case of bladder abscess, or in the œsophagus and stomach as Dr. Verdon has stressed, but in none of these organs is there a condition occurring which is at all comparable to the condition of the heart in primary angina pectoris. As Dr. Poulton says, it is often difficult enough to differentiate between primary and secondary angina pectoris, but the attempt must be made both clinically and in a discussion such as this.

I am, Sir, yours faithfully,
Derby, May 19th, 1930. DOUGLAS HUBBLE.

COMPLEMENT FIXATION IN GONORRHŒA.

To the Editor of THE LANCET.

SIR,—May I be permitted to break a lance with Dr. A. Knyvett Gordon? In your issue of May 3rd (p. 965) he is reported as saying to the Medico-Legal Society that: "The complement-fixation test .... gave a positive result in only 40 per cent. of cases of true gonorrhœa, and sometimes a false 'positive' was obtained. He did not now perform this test." Other workers have found a much higher percentage in all but early cases, varying from 60 per cent. in uncomplicated cases to nearly 90 in those with complications. Moreover, in a series of 5000 tests Dr. J. O. Oliver and I found the percentage of false positives as low as 0·6. It seems a pity to decry a reaction which may frequently be very helpful and which appears to be highly specific.

I am, Sir, yours faithfully,
T. E. OSMOND.

St. Thomas's Hospital, S.E., May 19th, 1930.

UNDULANT FEVERS OF DOUBTFUL ORIGIN.

To the Editor of THE LANCET.

SIR,—May I warn my colleagues in general practice of the prevalence of a type of fever which must be new to most of us? It has been discussed in your columns and the Ministry of Health has issued an excellent report by Dr. Dalrymple Champneys, but I find that its existence is generally not known to those whose attention does not chance to have been directed to it by some fortunate accident—in my own case by the conversation of a friend in the veterinary profession. This fever, which is due to an organism known as *Bacillus abortus*, has long been known as causing epidemic abortion in cattle, pigs, and other livestock. Epidemic abortion is not a convenient term for use with our patients but we may take advantage of the close relationship between *B. abortus* and *M. melitensis* to call our cases undulant fever.

I have one such case under my care at the moment and the blood agglutinates *B. abortus* in 1 in 10,240 (Dr. A. B. Rosher). On making inquiries I discovered three other cases under the care of colleagues, who kindly permitted me to see them. Their blood reactions were negative, but they were clinically undulant fever. As I am informed that cattle from which the organism can be recovered by no means always give the reaction, these negative laboratory results do not worry me. I have heard of two other cases not in this district and have seen the chart of one. It was typical. I have also called to mind (which I should have done sooner) two cases in this district in which agglutination was positive. One of these was fatal. These two cases occurred about a year ago. It seems fair to describe this disease as prevalent.

The onset of the attack is rather acute and is often accompanied by profuse sweating—a good diagnostic point. Fever ranges to about 102° or 103° F. and after a week or so tends to rule somewhat lower.

There follows another short period of higher temperatures, and this alternation continues with a steady downward trend for as many as eight or nine weeks or more. During this time the possibility of typhoid, paratyphoid, or tuberculosis, inevitably occurs to the mind.

In the cases which I have seen there was no common milk-supply nor (as is sometimes the case) any history of contact with infected pigs or cattle. The disease is rampant amongst cattle all over the country, but its restricted prevalence amongst human beings suggests that milk is not the vehicle of infection.

I am, Sir, yours faithfully,

Sevenoaks, Kent, May 15th, 1930. GORDON WARD.

Obituary.

CHARLES EDWARD WALLACE BELL, M.R.C.S. ENG.

THE death of Mr. C. E. Bell on May 13th, at the age of 77, removes a man who played a prominent part in the medical life of Exeter for many years. The youngest son of the Rev. F. Bell, an honorary canon of Truro Cathedral, he began his professional career in Exeter in 1871 as a pupil of Dr. John Woodman at the Royal Devon and Exeter Hospital. In 1876 he was appointed honorary surgeon to the Exeter Dispensary, and ten years later was elected consulting surgeon to that institution. He was its president in 1927, and a member of its committee at the time of his death. In 1888 he was elected surgeon to the Royal Devon and Exeter Hospital, and retired from the active surgical staff in 1916, being then appointed consulting surgeon and an honorary life governor in appreciation of his long service. At the time of his resignation from the active staff he was chairman of the hospital's nursing committee, and remained in that office till 1929. Of other public work it may be mentioned that for many years he was surgeon to the Exeter city police force. During the last part of his life, when he had retired from active practice, the hospital remained Mr. Bell's paramount interest, and he was a scrupulously regular attendant at the weekly board meetings—apart from his work on the nursing committee, in which he took an especial pride. Strong in his convictions, and throughout his lifetime outspoken and critical in his views, he certainly did not court popularity; and though jealous of the prestige of his profession and able to speak with a weight of long experience behind him in matters of medical policy, in his later years he sometimes found himself opposed to the views of his younger colleagues. He therefore tended to become a somewhat solitary figure, especially as Mrs. Bell died many years before him.

Bell was well known locally as a violinist, and music was his chief hobby. His wife was an accomplished pianist and violinist, and during her lifetime many off-duty hours were devoted almost daily to chamber music at home with their friends. For years, moreover, he was the able leader of the first violins in the Western Counties Oratorio, and other local musical societies. He had been in his younger days a good cricketer and Association footballer, and up to the last year or so made a point of supporting Exeter cricket and Association football clubs, and of attending their matches. He had no children.

THE LATE PROF. YAMAGIWA.

Dr. W. Cramer sends the following notes concerning the late Prof. Yamagiwa, whose death we recorded in an annotation last week:—"Yamagiwa's first publications dealt with problems of general pathology, such as inflammation and regeneration of tendons. He also published in 1900 a paper on beri-beri, Beiträge zur Kenntnis der Kakke, *Virch. Arch.*, vol. clvi. After a detailed description of the pathological changes found in patients who had died from the disease, he discussed its ætiology. He showed that the condition is not contagious, and cannot be due to a pathogenic organism. He came to the conclusion that it is due to poisoning by food, and that it can be prevented by altering the diet. The article of diet which he incriminated was "bad rice." The cancer problem then attracted his attention, and in 1905 he published a monograph in Japanese entitled the Histogenesis and Pathogenesis of Cancer of the Stomach. This was followed in 1911 by a paper on Primary Carcinoma of the Liver, *Virch. Arch.*, vol. ccvi., and at a meeting of the Japanese Pathological Society he communicated a paper on the Influence of Heredity on the Incidence of Cancer in Man. In his monograph on gastric cancer he established the following principles: 'For the development of carcinoma, each organ has its own history and its own causation. . . . There are no inborn cancer cells and no specific cancer germs.' In 1915 he published, with his assistant Ichikawa, his classical paper entitled Experimentelle Studien über die Pathogenese der Epithelialgeschwülste, Gewidmet unserem, grossen, lange verewigten, Lehrer, Rudolf Virchow, aus Dankbarkeit.

"When, in 1918, two American authors questioned the true malignant nature of the tumours produced by painting with tar over a long period, without having themselves repeated the experiments, Yamagiwa simply replied in a later paper: 'If they do not believe our results they should apply tar to the ear of rabbits with the same patience as we have done, in experiments lasting for months and even years.' The results were soon confirmed by Tsutsui, a pupil of Yamagiwa, who produced cancer in the skin of mice by tar-painting, and they were established as an experimental method by Fibiger, and by Murray and Woglom, who carried out experiments on a large scale. The advantage of the method discovered by Yamagiwa over Fibiger's experiment consisted in the fact that cancer could now be produced in an accessible site, and that all the stages of carcinogenesis could be studied with relative ease. Yamagiwa himself continued his investigations and succeeded in producing in rabbits cancer of the mamma by the injection of tar suspensions into the mammary region.

"It is impossible to over-estimate the importance of Yamagiwa's discovery for the study of cancer. It is not merely that it placed the doctrine of chronic irritation as a cause of cancer on a sound experimental basis, while before it had merely been one of many different theories advanced as an explanation. It also provided cancer research with a method which has given a new impetus to the investigation of the disease, and which, even within the few years which have elapsed since it has been adopted, has enormously increased our knowledge of some of the most obscure and baffling problems of cancer."

FOOTBALL COMPETITIONS FOR HOSPITALS. — The Glasgow Charity Football Club competition this year produced £4656, which has been distributed among local hospitals and similar institutions. Since the competition was begun in 1877 it has provided over £100,000 for these purposes.

PROGRESS OF CONTRIBUTORY FUNDS.—At the annual meeting at Southport last week in connexion with the London, Midland and Scottish Railway Hospital Fund it was reported that the contributions from the members of the staff, numbering approximately 240,000, amounted last year to £141,317, as compared with £100,640 in 1928; the increase was mainly due to the higher rate of the weekly contributions. The total receipts were £189,410. The amount paid to hospitals and kindred institutions was £120,405; railway convalescent homes received £21,994.—The latest figures show that more than 86 per cent. of the gas-workers in South London are members of the Hospital Saving Association. The South Metropolitan Gas Company's group, which has 7709 contributors, is one of the largest subscribing units in the country.—Last year the contributory scheme at the Hampshire County Hospital increased its membership by 2000 to 32,000, its branches to 293, and its income to a little over £11,000.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

MENTAL TREATMENT BILL.

REPORTED TO THE HOUSE OF COMMONS AND PASSED.

THE House resumed, on Wednesday, May 14th, consideration of the Mental Treatment Bill as amended in the Standing Committee.

Voluntary Patients.

Clause 2 deals with the reception, death, and discharge of voluntary patients. Subsection (3) provides that:—

If any person received as aforesaid becomes at any time incapable of expressing himself as willing or unwilling to continue to receive treatment, he shall not thereafter be retained as a voluntary patient for a longer period than one month, and shall, if he has not been previously discharged, be discharged on the expiration of one month from the date on which he became incapable of so expressing himself, unless in the meantime he has again became capable of so expressing himself, or steps have been taken to deal with him either under the principal Act as a person of unsound mind or under Section 5 of this Act as a person who is likely to benefit by temporary treatment.

Colonel WEDGWOOD moved to omit all the words after the words "so expressing himself." He said that this amendment raised the whole question of Clause 5 which provided for temporary treatment without certification. Under Clause 5 doctors would have an opportunity of getting their patients into an asylum without feeling that they were condemning them to long segregation. Therefore doctors being merely human beings would naturally select the more humane way, and gradually there would be more and more people sent to mental hospitals, not because they were certified in a way which would involve risks to the doctors, but because they entered first as voluntary patients and then became temporary patients. He wanted to prevent people who entered as voluntary patients being liable on that account to be suddenly converted into temporary patients. If the Government really had the interests of patients at heart they should accept the amendment.

Mr. ERNEST WINTERTON seconded the amendment.

After further debate,

Miss SUSAN LAWRENCE (Parliamentary Secretary to the Ministry of Health) said that they were dealing with the case of a patient who feared that he was losing his reason, and then unfortunately actually did so. He then became either incapable of expressing himself, or he became insane. Such cases not improbably might arise. Very often persons who were subject to mental disease knew quite well that they were in danger, and a patient in that condition who was told that voluntary treatment might avert the attack entered as a voluntary patient. But his hopes might not be realised, and he might become either incapable of volition or insane but with volition, though of a misguided nature. Such a person could not remain as a voluntary patient, for the whole essence of the Bill was that voluntary treatment should only be given to those who expressed a wish for it. Something must be done for that kind of patient. In his own interests, and in the interests of the community, he must have care appropriate to his condition. The person in charge was directed in that case to take steps so that the patient might be dealt with under Clause 5. If certified the person would have the usual safeguards of the Lunacy Act, the two doctors and the magistrate, while if he came under Clause 5 the opinions of two doctors were necessary, the relatives had to be informed, and there would be all the safeguards provided in Clause 5 in the case where a person became incapable of volition while a voluntary patient. This amendment was based on a complete misunderstanding of the Bill.

Dr. VERNON DAVIES said that in the majority of these cases the patients were taken away by the relatives, so that there was no possibility of a patient being illegally detained beyond a day or two. The amendment was not only unnecessary but it was dangerous, and he was certain that the Government would not accept it.

Dr. MORRIS-JONES said that this matter had been very carefully examined by the Royal Commission, and he thought that Colonel Wedgwood was unduly alarmed about the clause. Investigations had proved that there had been no illegal detentions. Safeguards were provided, and there was no other alternative but to adopt the clause as it stood.

After further debate the amendment was rejected by 241 votes to 106.

Minor Amendments Accepted.

On Clause 4 (power to lodge relatives and friends of patients),

Mr. GREENWOOD (Minister of Health) moved an amendment providing that relatives or friends of patients lodged in a hospital or licensed house should not be reckoned as patients if they were lodged in a part of the premises not permitted to be used for the accommodation of patients.

The amendment was agreed to.

On Clause 5 (provision for temporary treatment without certification of certain persons),

Colonel WEDGWOOD moved an addition to the clause providing that the Board of Control should upon the signed request of any person who considered himself to be unjustly detained under an application, recommendation, or order, furnish him, or his authorised representative, with a copy of the document.

Mr. GREENWOOD accepted the amendment, which was agreed to.

The Pauper Stigma.

Mr. WINTERTON moved to insert at the end of Subsection (14) the following proviso:—

(*a*) Section 6 of the Luancy Act, 1890, shall apply to all pauper patients;

(*b*) any person appointed by the patient to be present at the consideration of the petition under Subsection (3) of Section 6 of the Lunacy Act, 1890, shall have the right to make representations on behalf of the patient.

He said the purpose of the amendment was to give rate-aided patients exactly the same privileges as were enjoyed by private patients.

Mr. C. WILLIAMS seconded the amendment.

Mr. GREENWOOD said he had explained on the second reading that it was not possible in this Bill to do what was asked in this amendment, because he wanted to achieve the maximum of accomplishment with the minimum of controversy. He trembled to think what he would have had to face if he had done otherwise. He would remind Mr. Winterton that in this Bill they were getting rid of the pauper stigma. Was that nothing? The next big thing which they were doing was to make it possible for people who had hitherto had no other form of treatment than that which followed certification to get the same treatment which the well-to-do were receiving. He was not opposed to the amendment, but his objection to it was that if it were adopted, with all the necessary consequential amendments, they would never get the Bill through.

The amendment was withdrawn.

Board of Control: Unpaid Commissioners.

On Clause 11 (Reorganisation of the Board of Control),

Lieut.-Colonel FREMANTLE moved an amendment to provide that on the Board there should be two unpaid Commissioners of whom one should be a layman and the other a laywoman. He said that the unpaid Commissioners on the Board at the present moment were reckoned to be doing good work. He thought it was desirable that there should be still an unpaid unofficial element in order to bring the point of view of the ordinary man and woman into the working of the Board. Public confidence was far more likely to be given to the Board if there were unpaid members on it than if it were simply a body of paid officials.

Dr. VERNON DAVIES, in seconding the amendment, said that the addition of unpaid members would increase the status of the Board of Control and give a measure of confidence to the public that the lunacy laws were being administered in a fair and reasonable manner.

Mr. GREENWOOD said he could not accept the amendment. He was still of the opinion that the principle of appointing lay commissioners was foreign to the spirit of the Royal Commission's report. No one would persuade him that they would have an effective machine if it was composed partly of volunteers. There was no other department of the State to-day which placed heavy executive and administrative responsibilities on an honorary staff. Why then should it be done with regard to the Board of Control? This amendment, he believed, would be injurious to the interests of mental treatment, and he asked the House to reject it.

After further debate the amendment was rejected by 163 votes to 63.

Two Senior Commissioners to be Medical.

Lieut.-Colonel FREMANTLE moved an amendment to provide that two of the senior commissioners, other than the chairman, should be medical commissioners. He said the object of the amendment was to carry out a further proposal in the report of the Royal Commission. Looking at the work of the Board of Control it was quite clear that it was mainly legal and medical. So much was this the

case that the Royal Commission said it might be desirable to appoint two medical commissioners, one having experience of institutional administration, and the other possessing special scientific knowledge. They could not as a rule get one medical man who could fulfil both these qualifications.

Dr. VERNON DAVIES seconded the amendment.

Mr. GREENWOOD accepted the amendment, which was agreed to.

Status of Junior Commissioners.

Lieut.-Colonel FREMANTLE moved an amendment to provide that the paid commissioners, other than senior commissioners, should be appointed by His Majesty on the recommendation of the Board of Control. He said that this matter might be of only minor importance, but was it right that they should give an inferior status to those commissioners who were going to represent the Board of Control in inspecting mental institutions? They would be called upon to deal with men in the highest position in the profession who were the heads of these institutions, and it would make all the difference in the world if the visiting commissioners had the highest possible status.

Mr. WOMERSLEY seconded the amendment.

Miss LAWRENCE contended that it was right that they should mark a difference in status between the senior and junior commissioners. It was not generally the practice to appoint the junior officers in the civil service on the appointment of His Majesty. That was a form reserved for the very highest class. It was therefore quite unusual and quite unnecessary that the officials who acted in the main as inspectors of the Board of Control should have this especial mark of appointment by the Crown.

The amendment was negatived.

Miss LAWRENCE moved an amendment to provide that the junior commissioners should include women as well as men.

The amendment was agreed to.

Proceedings against Doctors.

On Clause 16 (which amends Section 330 of the principal Act),

Miss LAWRENCE moved the omission of the second subsection which deals with proceedings against doctors. She moved the substitution of the following subsections:—

(2) No proceedings, civil or criminal, shall be brought against any person in any court in respect of any such matter as is mentioned in the last preceding subsection, without the leave of the High Court, and leave shall not be given unless the court is satisfied that there is substantial ground for the contention that the person, against whom it is sought to bring the proceedings, has acted in bad faith or without reasonable care. (3) Notice of any application under the last preceding subsection shall be given to the person against whom it is sought to bring the proceedings, and that person shall be entitled to be heard against the application. (4) Where on an application under this section leave is given to bring any proceeding, and the proceedings are commenced within four weeks after the date on which leave was so given, the proceedings shall for the purposes of the Public Authorities Protection Act, 1893, be deemed to have been commenced on the date on which notice of the application was given to the person against whom the proceedings are to be brought.

She said it would be remembered that the Royal Commission pointed out that the protection allowed by law to medical men against whom proceedings were taken was not sufficient, and that many doctors would not sign certificates on account of the difficulties in which they might be landed. The Government resolved to carry out the recommendations of the Royal Commission, and inserted a form of words which was discussed in Committee. As a result of that discussion the Minister of Health promised to meet some of the difficulties and objections raised. The Government had very considerably amended the original clause which provided that a doctor was obliged to apply to the judge for a stay of proceedings. In this new clause proceedings might be conducted in a more appropriate way. Before an action began a judge had to be satisfied that there was substantial ground for it. Many people who had undergone treatment had been discharged partially cured, and they were unfortunately very likely to take legal proceedings. Dr. Hastings in the second reading discussion had said that there were two classes of insane people, and one of them included those people who never believed anyone, and who bore a grudge against everyone. It was quite likely that there might be a mass of baseless actions against doctors, and the Government had provided that leave must be given for the initiation of such proceedings against a medical practitioner. She hoped that in its new form the clause would meet the apprehensions expressed by hon. Members.

The amendment was agreed to.

Conflicting Views.

On the motion for the third reading,

Sir B. MERRIMAN said it was an outrage that the third reading of this Bill should be taken at 4 o'clock in the morning. He did not know whether the House realised that they had passed a clause which almost as an isolated instance deprived a whole class of persons of their right to bring an action.

Dr. DAVIES said he would like to corroborate the remarks of Sir B. Merriman. They were passing a Bill that would affect thousands of people, but they were passing it with a minimum of discussion and a maximum of forced closure. They had not been able to do justice either to themselves or to the people whom they represented. There were many provisions in the Bill which he was perfectly certain would not act as the House wanted them to act. The Bill was going to be detrimental to the treatment of mental disease. It would prevent some people submitting themselves for treatment as early as they should do. The obstinacy of the Minister of Health in refusing to accept changes with regard to the Board of Control would also have a detrimental affect. The responsibility was upon every Member who had forced this Bill through without discussion and without regard for the advice of men who knew what they were talking about. The Labour party jeered at the medical profession, and imputed to them unworthy motives. They did not recognise that the health of the country was in the hands of the medical profession, and that public opinion regarding medical men was not improved by constant ill-informed criticism.

Mr. WINTERTON said of all the people who had the right to complain surely the medical profession had the least. This Bill would probably have never seen the light except for the demand of the medical profession that they should be relieved of certain obligations which most other professions were willing to accept. If he felt that the patients who would come for treatment under this Bill were as secure as the doctors, he would feel a great deal happier.

Dr. MORRIS-JONES said he thought this Bill was a very excellent Bill, and he congratulated the Minister of Health on getting it through. It was a great charter for the poor, who for the first time were given as good a chance as the rich. He could not agree with Mr. Winterton in regard to the privileges accorded to the medical profession. He (Dr. Morris-Jones) emphatically denied that there was anything in the Bill that conferred any privileges on the medical profession.

The Bill was read the third time and passed.

HOUSE OF LORDS.

THURSDAY, MAY 15TH.

WORKMEN'S COMPENSATION (SILICOSIS) BILL.

The Workmen's Compensation (Silicosis) Bill was read the third time.

HOUSE OF COMMONS.

WEDNESDAY, MAY 14TH.

Leprosy in the Sudan.

Lieut.-Colonel FREMANTLE asked the Secretary of State for Foreign Affairs if his attention had been drawn to a recent report by the medical secretary of the British Empire Leprosy Relief Association on his visit to the Sudan to the effect that advanced and infectious cases of leprosy were prevalent, that the disease was spreading into British East African territories from the Belgian Congo, that at Yubo as many as 23 per cent. of contacts acquired the disease, and that further spread of the disease could only be arrested by active and enthusiastic development of technical education and administrative action with the concurrence of native opinion, which was well disposed to it, by both missionary and Government agencies under skilled supervision; and what action he proposed to take in the matter.—Mr. DALTON (Under Secretary for Foreign Affairs) replied: No, Sir. I have not as yet seen a copy of the report to which the hon. Member refers. I will, however, draw the attention of the Government of the Sudan to it. I understand that Dr. Cochrane, secretary of the British Empire Leprosy Relief Association, recently visited the leper colonies at Wau, Tembura, and Yambio, and discussed the position with the officials of the Sudan Government.

THURSDAY, MAY 15TH.

Miners and Fibrosis of the Lungs.

Mr. HOPKIN asked the Home Secretary if his attention had been drawn to the work done at the Beck Laboratory, Swansea, in the investigation of the causes of fibrosis of the lungs of miners in the anthracite district; and, in view of such work, was he prepared to extend this work so that the staff might give more time to research work in this matter.—Mr. CLYNES replied: I understand that the work

referred to in the question is being carried on as part of a scheme of research organised by Prof. Cummins, the director of the Welsh National Memorial Association. As my hon. friend is aware, the Medical Research Council has recently set up, at my request, an expert committee on industrial pulmonary diseases, whose duty it is to consider proposals for new inquiries or extending existing inquiries and make recommendations to the Council, and I will see that his suggestion is brought to the notice of this committee. I am informed that the Council have already made a grant for the expenses in connexion with the research at this laboratory.

Hospital Lotteries.

Mr. GREENE asked the Home Secretary whether, seeing that the present position of the law with regard to lotteries entailed loss to recognised charities such as hospitals, he would consider the revision of the law to the effect that those desiring to promote lotteries might apply to some authority, later to be designated, for permission to promote such lotteries under conditions, later to be laid down, such as that a certain percentage of the moneys to be received should be distributed to approved charities.—Mr. CLYNES replied: Proposals of this kind have been considered from time to time, and I recall that in 1918 a scheme was before this House but, though confined to registered war charities, was rejected by a small majority. I am not, as at present advised, prepared to take the initiative in reopening the question.

Supply of Quinine in India.

Major GRAHAM POLE asked the Secretary of State for India if he had received from the Government of India a report of the present position in regard to the cultivation of cinchona and the manufacture and distribution of quinine in India, and in regard to the policy of the Government of India in this matter, in view of the facts brought out in the statement of the director of botanical survey in India, in his report for 1928–29, that the poor in India were unable to purchase quinine at the price at which it was sold in India, and that charitable dispensaries had to turn malaria-stricken patients away empty or with inadequate doses.—Mr. WEDGWOOD BENN replied: I have not yet received the report in question, but from a report on the progress made in giving effect to the recommendations of the Royal Commission on Agriculture in India I see that the Government of India are in consultation with the provincial governments on the question of centralising the whole subject of cinchona cultivation and the manufacture and distribution of quinine, which according to the Royal Commission was the first step towards the reduction of the price of quinine in India to a level at which it would be possible to embark on an intensive antimalaria campaign.

TUESDAY, MAY 20TH.

Physically Defective School-children in Scotland.

Mr. TRAIN asked the Secretary of State for Scotland how many physically defective children were being conveyed to and from school in Lanarkshire; and how many other school-children were provided with transport facilities in Lanarkshire on account of the distance of the school from their homes.—Mr. ADAMSON replied: The number of physically defective children who are being conveyed to and from special schools by the education authority of Lanark is 602. In addition, 220 mentally defective and 24 deaf-mute pupils are being conveyed to and from such schools. The number of other pupils for whom conveyance facilities are provided is 2360.

EXTENSION OF BOURNEMOUTH HOSPITAL.—On Friday last week the Earl of Malmesbury, Provincial Grand Master of Hampshire and the Isle of Wight, laid the foundation-stone, with Masonic honours, of the new private wards and the extension of the specialist and out-patients' departments of the Royal Victoria and West Hants Hospital, Bournemouth. The enlargements include about 50 wards for paying patients, and when the work is completed £180,000 will have been expended on new accommodation within the last ten years.

BELGRAVE HOSPITAL FOR CHILDREN.—Last year the 2038 in-patients cost an average of £3 7*s.* 1*d.* per week (an increase of 7*s.* 5*d.* over four years ago). There were 16,247 new out-patients who cost 1*s.* 7¼*d.* per attendance. There were over 69,000 attendances. The out-patients' department is seriously overcrowded and plans are being prepared for the erection of a new one which, with a nurses' home, will cost £60,000. A ward of 12 pay-beds is now available at a fee of £3 3*s.* per week plus the moderate fees of the medical staff graduated according to the circumstances of the parents.

Medical News.

UNIVERSITY OF OXFORD.—The electors of the George Herbert Hunt travelling scholarship have awarded the scholarship for 1930 to Ronald Graeme Macbeth, B.M.

UNIVERSITY OF CAMBRIDGE.—Mr. Stanley Baldwin has been elected Chancellor of the University in place of the late Lord Balfour.

At a congregation in June it is proposed to confer an honorary degree on Sir John Rose Bradford, F.R.S., President of the Royal College of Physicians of London.

On May 16th the following degrees were conferred:

M.B. & B.Chir.—J. V. Broad, E. C. Wynne-Edwards, and E. R. Keeble.

B.Chir.—L. J. Haydon.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—Dr. W. S. Thayer, emeritus professor of medicine in the Johns Hopkins Hospital, Baltimore, will deliver the Gibson memorial lecture at the College at 5 P.M. on Tuesday and Wednesday, May 27th and 28th. His subject will be Endocarditis.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College on May 15th, with Dr. James Haig Ferguson, the President, in the chair, the following 21 candidates (out of 68 entered) who passed the requisite examinations between Jan. 2nd and 10th of this year, were admitted to the Fellowship:—

Subbier Annaswami, Douglas James Brown, Ernest Joseph Burton, Alfred Bramwell Cook, Joseph Eli Erdheim, Mohammad Husnain, Frederick William Helmore, Keith Lindsay Hugh Kirkland, Douglas Alfred Langhorne, Shu Pui Li, James Craig McMaster, Cecil David Meadowcroft, Marjorie Murrell, James Purce, Aubrey David Dick Pye, Marion Aroha Radcliffe-Taylor, John Fletcher Robinson, John Bertrand De Cusance Morant Saunders, Alexander Brownlie Smith, Richard Fowler Ward, and David Wilkie.

R. V. P. Campbell, S. R. Woodcock, and Bartholomew Hair received the Higher Dental Diploma.

The Bathgate memorial prize was, after a competitive examination in materia medica, awarded to Mr. G. L. G. Major.

UNIVERSITY OF LONDON MEDICAL GRADUATES SOCIETY.—The annual meeting and dinner of this Society was held on May 13th, at the Langham Hotel, with Sir StClair Thomson, the President, in the chair. Replying to the toast of the guests, Dr. Edwin Deller, Principal of the university, said that for too long the university had been regarded by her graduates as a stony-hearted stepmother, who scrutinised them, examined them, took their fees, rejected them, re-examined them, passed them, and then cast them adrift to shift for themselves. He hoped that before long they would have a home of their own on the Bloomsbury site, which would help to draw the graduates together. The society was already helping to draw together the graduates of the biggest and greatest faculty. The toast of the society was proposed by Prof. G. E. Gask, who spoke of the high standard which it had always maintained in medicine. Mr. W. McAdam Eccles, in his reply, said that with over 4000 medical graduates of the university, the scope for the society was very great.

Sir John Rose Bradford, F.R.S., was elected President for the ensuing year.

A HOSPITAL EXHIBITION.—At the conference of the British Hospitals Association at Newcastle on June 18th, 19th, and 20th, there will be an exhibition of plans of recent hospital construction. There will also be an opportunity for firms to exhibit anything new in the way of fitments, furniture, and appliances, the only condition being that these have only recently been put on the market and are not too bulky. Firms wishing to exhibit are asked to communicate with Mr. S. Dunstan, House Governor and Secretary of the Royal Victoria Infirmary, Newcastle-upon-Tyne.

GERMAN PHARMACOLOGICAL SOCIETY.—The annual meeting of this society will be held in Königsberg from Sept. 4th to 7th, to discuss problems of the general reaction of the organism from the pharmacological standpoint. The subject will be introduced from four points of view by (1) Starkenstein (Prague), Problems of Inflammation; (2) Freund (Münster), Problems of Febrile Diseases; (3) Storm van Leeuwen (Leiden), Allergy; (4) Schulemann (Elberfeld), Problems of Reticulo-endothelium and its Functions. Any who wish to take part are asked to communicate before July 10th with the president of the society, Prof. J. Schüller, Pharmacological Institute, Zülpicherstrasse 47, Cologne, or with the business manager, Prof. Lipschitz, Pharmacological Institute, Weigertstrasse 3, Frankfurt a.M.

UNIVERSITY OF ABERDEEN.—Sir Arthur Keith, F.R.S., conservator of the Museum of the Royal College of Surgeons of England, has been invited to stand as independent (non-political) candidate for the Rectorship of the University in succession to Lord Birkenhead.

CHILD GUIDANCE COUNCIL.—This Council has changed its address to 7, Buckingham Palace-gardens, London, S.W. 1. (Tel.: Sloane 9021.)

POST-GRADUATE COURSE AT CARLSBAD.—An international medical course, with special reference to balneology, will be held again this year at Carlsbad, Czechoslovakia, from Sept. 14th to 30th. Particulars may be had from Dr. Edgar Ganz at Carlsbad.

CENTRAL BUREAU OF HOSPITAL INFORMATION.—The address of this office will in future be 12, Grosvenor-crescent, London, S.W.1. (Tel.: Sloane 7136.) This is also the new address of the Joint Council of the Order of St. John and the British Red Cross Society.

JEWISH HEALTH ORGANISATION OF GREAT BRITAIN. On Sunday, May 25th, at 3.15 P.M., Sir Humphry Rolleston will take the chair at a symposium on the Physical and Mental Aspects of the Jew. The meeting will be held at Conway Hall, Red Lion-square, London, W.C., and the speakers will be Prof. M. Ginsberg, Dr. L. Isserlis, Dr. W. M. Feldman, and Dr. E. Miller. The address of the secretary is 19, Dorset-square, N.W. 1.

RESEARCH DEFENCE SOCIETY.—The annual general meeting of the society will be held at the House of the Medical Society of London, 11, Chandos-street, Cavendish-square, W. 1, on Tuesday, June 3rd, at 3.15 P.M. The chair will be taken by the President of the society, Lord Lamington, and a lantern lecture will be delivered by Mrs. E. Mellanby on Diet and Dental Disease. The lecture, the Fourth Stephen Paget Memorial Lecture, will illustrate the lessons learned from animal experiments.

DONATIONS AND BEQUESTS.—The late Miss Sarah Caroline Brand, of Stone House, Ickleton, Cambs, among other bequests left £1000 to Addenbrooke's Hospital, Cambridge, for the endowment of a bed in her name, and £1000 for the endowment of two cots in the name of her sister, Mary Jones Brand; £500 to St. Dunstan's Hostel for Blinded Sailors and Soldiers, and £100 each to the National Institute for the Blind and Dr. Barnardo's Homes.

LADIES' MEDICAL GOLFING SOCIETY.—The spring meeting was held at Ashford Manor Golf Club on May 20th, under pleasant conditions, and was well attended. The prize-winners were as follows:—Canny Ryall Cup: Mrs. A. C. Palmer, 95—21=74. Scratch prize: Mrs. H. Guedalla, 82. Best net scores under handicap, 1st Division: Mrs. Grange Harrison, 77; Mrs. Roberts Harris, 78. 2nd Division: Mrs. J. S. Burn, 77; Mrs. Hopkins, 77. 3rd Division: Mrs. Massey, 74; Mrs. Norwood Brown, 81. Bogey Greensomes: Mrs. Lewis Smith and Dr. M. H. Kettle, 5 up; Lady Ryall and Mrs. Russell-Smith, 4 up.

CHARING CROSS HOSPITAL: AN AMERICAN WING.—A wing, endowed by American subscriptions, is shortly to be opened at Charing Cross Hospital. Upon the exterior will be placed the inscription, "Columbia Wing. Endowed by the generosity of American citizens." The largest subscriber to the wing, which will consist of two wards of 20 beds, is Mr. E. Stephen Harkness, of New York, who has given £5000. A further £15,000 is, however, still needed.

JEWISH HOSPITAL.—Last year this hospital, at Stepney Green, completed its first decade of full work—it began in a small way as an out-patient department only. During the year 1531 in-patients were treated at an average weekly cost of £3 2*s*. 7*d*., a reduction of 4*s*. 5*d*. It is hoped that Jewish patients may, to a large extent, be centralised by the London County Council in one of the East End municipal hospitals. This would enable the Jewish Hospital to transfer cases of chronic disease and others unsuitable for treatment within its walls.

INSURANCE AGAINST MISTAKEN DIAGNOSIS.—Westminster City Council has followed the lead of Stoke Newington (see THE LANCET, March 22nd, p. 636) in insuring its officers against claims arising out of errors in diagnosis, in view of the prevalence of small-pox and the notorious difficulties in its differentiation. The Westminster Health Committee has obtained quotations from insurance companies and recommends the council to insure its medical officer of health against such risks. Nine boroughs in London have now taken out such policies, and ten others are considering the advisability of so doing.

BRITISH SOCIAL HYGIENE COUNCIL.—The Marquess of Linlithgow has resigned the office of President of this Council and Sir Basil Blackett is to succeed him.

A MEDICAL FREEMAN.—Dr. George Harrison, J.P., has been elected a freeman of the city of Chester. His great-grandfather and grandfather and his two paternal uncles, all of whom were medical practitioners, received the same honour.

MATERNITY CASES AT SHEFFIELD.—The basis of admission to the Nether Edge Hospital has been altered pursuant to a recommendation of a special sub-committee of the Sheffield city council. In future admission to the maternity blocks is to be on the basis of home conditions, plus medical and surgical need; decisions in regard to admission are to rest with the surgical staff, and the facts relating to the financial position of patients are to be obtained by the health visitors' staff for the use of the almoner, when appointed.

LEICESTER ROYAL INFIRMARY.—This hospital last year received 7107 in-patients and 13,564 out-patients; the casualties numbered 19,523, and the income was £85,870, leaving a deficit of £764, which brings the accumulated deficits up to £16,000. There was a considerable reduction in the number of motor-car patients, but a substantial increase in patients injured in pedal and motor-cycle accidents. The latter were more serious than the car accidents. Altogether, accidents cost the hospital nearly £11,000. The average cost per occupied bed was £158.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, May 27th.—5 P.M., MEDICINE. Election of Officers and Council.

WEDNESDAY.—5 P.M., COMPARATIVE MEDICINE. Election of Officers and Council. Short Papers: Dr. J. A. Arkwright: Note on a Few Cases of "Show Fever" in Cats. Dr. R. T. Leiper: Demonstration of Helminthological Preparations. Dr. Tom Hare: A Case of Canine Verminous Bronchitis Due to Oslerus Osleri.

FRIDAY.—5 P.M., DISEASE IN CHILDREN. (Cases at 4.30 P.M.). Election of Officers and Council. Presidential Address: Mr. H. A. T. Fairbank: Some Remarks on Osteo-Genesis Imperfecta. Cases will be shown. ANÆSTHETICS. Dinner of the Section at the Adelaide Galleries, King William-street, Strand, W.C., at 7.45 P.M.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASE, 11, Chandos-street, Cavendish-square, W.

FRIDAY, May 30th.—8.30 P.M., Dr. D. N. Nabarro: Paper on Some Pitfalls in the Diagnosis and Treatment of Congenital Syphilis. A discussion will follow.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION 1, Wimpole-street, W.

MONDAY, May 26th to SATURDAY, May 31st.—MILLER GENERAL HOSPITAL, Greenwich, S.E. Mon., 2 P.M., Dr. E. C. Warner (Selected cases—children), clinical demonstration. No fee. Fri., 2 P.M., Demonstrations by Mr. Arthur Gray (Gynæcological operations) No fee.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Special M.R.C.P. lectures by Dr. B. T. Parsons-Smith. Tues. 8.30 P.M., Coronary Thrombosis. Fri., 8.30 P.M., Cardiac Failure.—HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C. Special two weeks' course consisting of lectures, demonstrations, operations. Mornings only.—QUEEN MARY'S HOSPITAL, Stratford, E. Special all-day course in medicine, surgery, and the specialties with especial reference to tuberculosis. Two weeks.—Further particulars from the Fellowship of Medicine.

ST. MARY'S HOSPITAL INSTITUTE OF PATHOLOGY, W.

THURSDAY, May 29th.—5 P.M., Sir Thomas Lewis: Reactions of the Skin to Cold.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.

TUESDAY, May 27th.—5 P.M., Dr. H. Burt-White: Investigation and Treatment of Puerpural Pyrexia.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, May 26th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Wards.

TUESDAY.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Mr. Hamblen Thomas: Throat, Nose, and Ear Dept. 2.30 P.M., Sir Henry Simson: Gynæcological Operations.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2.30 P.M., Mr. Donald Armour: Surgical Wards. Dr. Scott Pinchin: Medical Out-patients.

THURSDAY.—Closed.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Department. 2 P.M., Mr. Sinclair: Operations.

SATURDAY.—9 A.M., Mr. Vlasto: Throat, Nose, and Ear Operations. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Children's Department.

Daily, 10 A.M. to 5 P.M., Medical, Surgical, and Special Out-patients, Operations, Ward Visits, Anæsthetic Courses.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, May 26th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose, and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations. 4.30 P.M., Dr. W. N. Goldsmith: Bullous Eruptions. (Special lecture.)

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat, and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M., Medical, Surgical, and Children's Diseases Clinics. Operations.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, March 26th.—12 noon, Dr. Greenfield: Cerebro-spinal Fluid. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Mr. Leslie Paton: Papillœdema.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Mr. Armour: Spinal Injuries.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Mr. Julian Taylor: Ventriculography and Radiological Diagnosis of Cerebral Tumours.

FRIDAY.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Mr. Elmquist: Demonstration of Re-educative Methods. (In Exercise Room.)

ROYAL NORTHERN HOSPITALS POST-GRADUATE LECTURES.

WEDNESDAY, May 28th.—3.15 P.M. (at the Royal Chest Hospital, City-road), Dr. Ernest Fletcher: Electrocardiographic Diagnosis of Heart Disease.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, 49, Leicester-square, W.C.

WEDNESDAY, May 28th.—5 P.M., Dr. Leonard Hill: Penetration of the Skin by Radiation. (Annual oration.) Annual dinner at Kettner's Restaurant at 6.45 for 7 P.M.

ROYAL DENTAL HOSPITAL OF LONDON SCHOOL OF DENTAL SURGERY, Leicester-square, W.C.

MONDAY, May 26th.—5 P.M., Dr. E. C. Rosenow, of the Mayo Clinic, Minn., U.S.A.: Post-graduate lecture on Elective Localisation of Streptococci following their Inoculation into the Teeth of Dogs.

UNIVERSITY COLLEGE, Gower-street, W.C.

FRIDAY, May 30th.—5.30 P.M., Prof. G. H. Parker, Professor of Zoology and Director of the Zoological Laboratory, Harvard University: A Public Lecture on The Secretory Action of the Nervous System.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, May 27th.—4.15 P.M., Dr. J. Shaw Dunn: Tertiary Syphilitic Lesions.

FRIDAY.—4.15 P.M., Dr. A. H. Holmes: Demonstration of Medical Cases.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

WEDNESDAY, May 28th.—4.15 P.M. (at the Eye Infirmary), Mr. W. B. Inglis Pollock and Dr. H. S. Martyn: Eye Cases.

Appointments.

HARRIES, D. J., M.D., B.S. Lond., has been appointed an additional Referee under the Workmen's Compensation Act for Barry and Cardiff County Courts.

PEARCE, JOHN D. W., M.B. Edin., D.P.M., Third Assistant Medical Officer and Assistant Pathologist at the City Mental Hospital, Humberstone, Leicester.

THOMPSON, S., L.M.S.S.A. Lond., Asst. Clinical Tuberculosis Officer, Leeds Corporation.

Certifying Surgeons under the Factory and Workshops Acts: BENNETT, A. W. C., L.R.C.P. Lond., M.R.C.S. (Swindon); JONES, M. W. (Llanybyther, Carmarthen); and WITNEY, E. W., M.B., B.S. Lond. (Whitstable).

Vacancies.

For further information refer to the advertisement columns.

Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £110.

Altrincham General Hospital, Cheshire.—Sen. H.S. Also Jun. H.S. At rate of £150 and £120 respectively.

Antrim County Council.—Chief Tuber. M.O. £750.

Bath, Royal United Hospital. H.P. £120.

Bath, Somerset, and Wilts Central Children's Orthopœdic Hospital. H.S. At rate of £120.

Berkshire C.C.—Asst. Tuber. O. and General Med. Asst. £600.

Birmingham, Ear, and Throat Hospital, Edmund-street.—H.S. At rate of £150.

Birmingham, Selly Oak Hospital.—Cas. O. At rate of £200.

Bolingbroke Hospital, Wandsworth Common, S.W.—Res. M.O. £200.

Bradford, City of.—Locum Tenens. 12 gns. a week.

Brighton, Sussex Eye Hospital, Queen's-road.—Hon. Surg. Also Hon. Clin. Asst.

Bristol, Clifton Dispensary, Dawny-square.—Res. M.O. £300.

Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.

Chelmsford and Essex Hospital.—Res. M.O. £150.

Chelsea Hospital for Women, Arthur-street, S.W.—Jun. H.S. At rate of £100.

Chesterfield and North Derbyshire Royal Hospital.—Cas. O. At rate of £200.

Chingford, Hospital for Infectious Diseases.—Res. M.O. £300.

City of London Hospital for Disease of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.

Colchester, Royal Eastern Counties Institution for Mental Defectives.—Jun. Asst. M.O. £350.

Cumberland C.C.—Asst. County M.O.H. £600.

Derbyshire Royal Infirmary.—Asst. H.S. and Cas. O. £150.

Dreadnought Hospital, Greenwich.—Anæsthetist. 50 gns. H.P. and H.S. At rate of £110.

Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Med. and Surg. Regs. Each £100.

General Lying-in Hospital, York-road, Lambeth, S.E.—Res. M.O. At rate of £100.

Gloucestershire Royal Infirmary and Eye Institution.—H.P. and H.S. At rate of £135 and £100 respectively.

Great Yarmouth General Hospital.—H.S. £125.

Guildford, Royal Surrey County Hospital.—Res. Med. and Surg. O. and Reg. £250.

Halifax Royal Infirmary.—3rd H.S. At rate of £125.

Hampstead Council of Social Welfare, 27, Heath-street, N.W.—Two M.O.'s.

Hertford County Hospital.—H.P. At rate of £150.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Hon. Psychiatrist. Two Med. Regs. Also Clin. Path.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. Also H.P. Each at rate of £100.

Hull Royal Infirmary.—H.S. At rate of £150.

Islington Dispensary, 303, Upper-street, N.—Res. M.O. £220.

Kent Education Committee.—School Medical Inspector. £600. Also Dental Surgeon. £550.

King's College Hospital, Denmark Hill, S.E.—Jun. Urological Surgeon.

L.C.C. Administrative County of London.—Med. Supt. £1000. Venereal Diseases Clinic: Chief Asst. M.O. £600. Two Jun. Asst. M.O.'s. Each £350. Hospital Service: Asst. M.O.'s. £300–£400.

Leeds Hospital for Women.—H.S. At rate of £50.

Liverpool, Mill-road Infirmary.—Res. Asst. M.O. £200.

Liverpool School of Tropical Medicine, Pembroke-place.—Research Asst. £400.

Liverpool, Royal Children's Hospital.—Hon. Anæsthetist.

London Hospital, E.—Cardiographic Dept. Paterson Research Scholar. £400.

London Jewish Hospital, Stepney Green, E.—Cas. O. At rate of £150.

London Lock Hospital, 91, Dean-street, W.—Hon. Surgeon to Out-patients.

London University, Chair of Physiology.—£1000.

Manchester, Crumpsall Hospital.—Radiologist. £500.

Manchester Northern Hospital for Women and Children, Park-place, Cheetham Hill-road.—Sen. H.S. Also Jun. H.S. £130 and £100 respectively.

Manchester Royal Children's Hospital.—Sen. M.O. to Out-patients. £300. Asst. S. £50.

Manchester Royal Infirmary.—H.P. and H.S. Each £200.

Manor House Hospital, Golders Green.—H.S. £200.

Margate and District New General Hospital.—Res. M.O. £125.

Metropolitan Ear, Nose and Throat Hospital, Fitzroy-square, W.—Clin. Asst.

Miller General Hospital, Greenwich-road, S.E.—Pathologist. £600. Out-patient Officer. At rate of £150. H.P. and H.S. Each at rate of £125.

National Hospital, Queen-square, W.C.—Jun. Reg. £200 Also Asst. Phys.

Newcastle-on-Tyne, Royal Victoria Infirmary.—Hon. Asst. to Electrical and Massage Depts.

Northampton General Hospital.—Asst. H.S. At rate of £150.

Norwich, Norfolk and Norwich Hospital.—H.S. £120.

Nottingham General Hospital.—2nd Cas. O. At rate of £150.

Plymouth, City of.—Deputy M.O.H. £750.

Plymouth City Hospital.—Res. Med. Supt. £1000.

Prince of Wales's General Hospital, Tottenham, N.—Hon. Surg. Reg.

Princess Louise Kensington Hospital for Children, St. Quintin-avenue, N. Kensington, W.—Almoner.

Queen's Hospital for Children, Hackney-road, E.—H.P. Also Cas. O. Each at rate of £100.

Rotherham County Borough.—Asst. M.O.H., &c. £700.

Rotherham Hospital.—Sen. H.S. £200.
Royal Free Hospital, Gray's Inn-road, W.C.—H.P.'s and H.S.'s to Special Depts. Obstet. H.S. £150. Also District Obstet. Asst. £100. Res. Anæsthetist to Gynæcological Obstetric Unit.
Royal National Orthopædic Hospital, Gt. Portland-street, W.—Hon. Anæsthetist.
St. Bartholomew's Hospital, E.C.—Physician.
St. Mary's Hospital, W.—Surgical Registrar. £200.
Saint Pancras Dispensary, 39, Oakley-street, N.W.—Res. M.O. £185.
St. Thomas's Hospital.—Physician. Also Physician to Out-Patients Dept. Also Asst. Dental S.
Salford Royal Hospital.—H.P. Also Cas. H.S. Each at rate of £125.
Salford, Lancs., Hope Hospital.—Asst. M.O. At rate of £250.
Salisbury General Infirmary.—Two H.S.'s. £150.
Sheffield Children's Hospital.—3rd Res. M.O. £100.
Sheffield, Jessop Hospital.—Res. M.O. £175.
Sheffield Royal Hospital.—Res. Anæsthetist. At rate of £80.
Sheffield Royal Infirmary.—H.S. £80.
Southampton, Royal South Hants and Southampton Hospital.—Asst. H.S. and Cas. O. Each £180.
South-Eastern Hospital for Children, Sydenham, S.E.—Asst. and Res. M.O.'s. At rate of £100 and £75 respectively.
Southern Rhodesia Medical Service.—3 Asst. and Relieving Government M.O's. Each £500.
Sunderland Royal Infirmary.—Hon. Phys. £500.
Swansea General and Eye Hospital.—H.S., Cas. O. Also H.P. Each at rate of £150.
Talgarth, Breconshire, South Wales Sanatorium.—Asst. Res. M.O. £250.
Torquay, Torbay Hospital.—Physician for V.D. Clinic. 2 gns. per session.
Warwick, Warwickshire King Edward VII. Memorial Sanatorium, Hertford Hill.—Med. Supt. £800.
Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £150.
West London Hospital, Hammersmith. W.—Hon. Surg. H.P., H.S., Aural and Ophth. H.S. Also Res. Asst. Cas. O. Each at rate of £100.
Weston-super-Mare General Hospital.—Res. H.S. £130.
Weymouth and District General Hospital.—H.S. £180.
Winchester, Royal Hampshire County Hospital.—Sen. Res. M.O. £200. H.P. and H.S. Each £150.
Windermere, Ethel Hedley Hospital for Crippled Children.—Res. H.S. At rate of £150.
Wigan Infirmary.—3rd. H.S. At rate of £150.
Willesden General Hospital, N.W.—H.P. £100.

Births, Marriages, and Deaths.

BIRTHS.

COX.—On Saturday, May 17th, to Dr. and Mrs. Chave Cox, of 137, Hornsey-lane, N.6, the gift of a daughter.
HEARLE.—On May 13th, at Liskeard, Cornwall, the wife of Dr. H. N. Hearle, of a daughter.

DEATHS.

BALDOCK.—On May 16th, at Earl's Court-road, Alfred Baldock, M.B., aged 80 years.
BELL.—On May 13th, at Southernhay West, Exeter, Charles Edward Wallace Bell, M.R.C.S., L.R.C.P., aged 77.
LUND.—On May 12th, at Germiston, South Africa, Theodor Lund, M.D.
O'GORMAN.—On May 11th, at a nursing home, Dublin, Colonel C. J. O'Gorman, D.S.O., R.A.M.C., of Warriston, Glenageary.
RICHARDS.—On May 14th, at his residence, St. Thomas'-street, Winchester, Thomas Decimus Richards, M.R.C.S.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

ESSEX PUBLIC MEDICAL SERVICE.—The (sixth) annual report for the year 1929 shows that the service increases in numbers and in financial stability. On the last day of the year, after deducting cancellations, removals, and deaths, there were 8573 books on which payments were being made, representing 16,750 subscribers (7985 adults and 8765 children). Owing to death or retirement eight doctors were taken off the books and eight new members were admitted, leaving 176 names on the books at the end of the year (127 on the active and 49 on the honorary list).

The total amount paid to doctors shows an increase of £646 over that paid in 1928. The average amount paid per person works out at 10*s.* 1*d.* The three largest totals collected for individual doctors in each class of district were: metropolitan, £384, £287, £259; urban, £766, £651, £471; semi-rural, £247, £237, £125; rural, £253, £161, £105. Collectors who work on a 15 per cent. commission basis have performed their duties with very little friction; arrears at the end of a quarter average under one-half per cent. of their books, the greater portion of which is collected by instalments in the following quarter. Assets of the service exceed liabilities by £153; the balance-sheet for 1928 showed an excess of liabilities to the extent of £132—an improvement of £285; it is now proposed to pay off a loan from the B.M.A. of £200; the balance of £50 on doctors' loan; and a grant of £50 to the benevolent fund, which supplies bandages, belts, stockings, and other appliances.

Notes, Comments, and Abstracts.

COLLECTION AND DISPOSAL OF REFUSE.

A CHADWICK public lecture was given at the Royal Sanitary Institute and Parkes Museum on May 15th, by Mr. Edward Willis, borough engineer of Chiswick, and chairman of council of the Institute. Refuse, he said, was of three sorts—domestic, trade, and street refuse; originally everything was thrown into the streets where it remained until carted away as manure. The first real improvement was the provision of underground sewers to take the place of open gutters. House refuse which consists of night-soil, rags, ashes and food debris, varies in bulk and weight, in mining districts being three times the weight it is in a southern town, and in summer only half what it is in winter. Metal food-containers provide a problem unknown fifty years ago and empty bottles used for beer, milk and mineral waters are liable to injure employees unless great care is taken. Of all these the debris of food is the most important, for it breeds flies unless collected at least once a week. Next comes trade refuse—cotton waste, rags, grease, carbide waste, paper, wood chips, fish offal—for whose removal the trader should pay. Lastly there is the street refuse, greatly reduced now that horses are 90 per cent. fewer and pneumatic tyres wear less dust off the roads, which are besides better made and surfaced. "But too much litter of paper is left on the streets," said Mr. Willis. "In Germany this is a punishable offence."

Collection of rubbish can only be made in the early part of the day in busy towns, but in residential suburbs throughout the morning. If the shoot (or dump) is within a mile, horse haulage is good; if it is at greater distances motor, rail, or barge transport is required. Refuse is best collected in dust-bins of municipal pattern, placed on the pavement by the occupier and emptied by a strong staff into a slowly passing motor which is covered, as in Westminster. Daily collection is an economy, and much more efficient.

Going on to speak of the disposal of rubbish, Mr. Willis said that dust-heaps were soon found to breed flies, crickets, and rats, and this led to the use of destructors. Even sewage sludge may be burned in these, and the clinker thus formed makes the better cement. Rubbish must be sorted before being put into destructor. There is the risk of bombs, live cartridges, &c., and tins have to be picked out and baled, after which they sell for perhaps 22*s.* a ton. Iron nails and wire are extracted by electro-magnets and sold separately. Fine dust, sifted out, is used for burning bricks, and in Southwark rubbish is "pulverised" to make manure. "Controlled tipping" (as at Bradford and elsewhere) is satisfactory in suitable places. A site which can be improved is covered to a reasonable depth with rubbish, and this is covered with nine inches of good vegetable soil. The temperature rises to 150° F., and in six months the refuse has become harmless and odourless. Suitable sites are needed, also proper soil and capable and zealous workmen. In the method of salvage, highly developed at Birmingham[1] and Marylebone, the driving principle is the proper utilisation of all waste material, just as in controlled tipping the object is to make the best of waste places.

In the course of his lecture Mr. Willis gave the following figures for the London cleansing services: Area, 117 square miles; population, 4,612,000; approximate cost, £2,200,000 per annum; averaged rate for public cleaning, 11d. in the £1; staff, 8500 persons; amount collected, 1,200,000 tons.

THE MANUFACTURE OF SULPHURIC ACID.

THE importance to chemical industry of an efficient manufacture of sulphuric acid lies in the fact that it is perhaps one of the most widely used of inorganic chemicals; besides being required for the production of artificial fertilisers, such as sulphate of ammonia and super phosphate of lime, it is employed in the manufacture of soda by the salt cake process, and thus in the manufacture of hydrochloric acid as well as in that of practically all other acids, both inorganic and organic; in addition it is employed as a sulphonating, condensing, and oxidising agent in the manufacture of many organic chemicals. In view of these facts it is not surprising that the study of the underlying theory of the methods of production with a view to improvement of yield have received much attention, the results of which are incorporated in many bulky text-books. A volume recently published[2] is to be welcomed on the ground that it contains in small compass all that the ordinary student of applied chemistry needs in the first instance,

[1] THE LANCET, 1929, i., 456.
[2] Sulphuric Acid and its Manufacture. By H. A. Auden, M.Sc.Vict., D.Sc.Tübingen. London: Longmans, Green and Co. 1930. Pp. 231. 16*s.*

references to larger books and original papers being supplied. It is common knowledge that there are two main processes employed in the manufacture of sulphuric acid, the older leaden chamber process depending upon the action of oxides of nitrogen in effecting the oxidation of sulphur dioxide to the trioxide, while the contact process relies upon contact catalysis to affect this change. The material used as catalyst in the early stages of the contact process was invariably platinum, whose efficiency compares with other materials since employed, such as iron oxides, shown by the fact that about 25–30 tons of this cheaper material are required to do the work of 4–5 lb. of platinum. The contact process alone can produce fuming sulphuric acid, and the demand for this material during the war necessitated increasing the production in the United Kingdom from 30,000 tons to 450,000 tons per annum.

EXPERIMENTAL PHONETICS.

THE first meeting of the International Society of Experimental Phonetics is to be held at Bonn from June 10th to 14th, when lectures will be given by experts from various European countries, including Prof. E. Blancquaert (Ghent), Prof. P. Fouché (Strasbourg), Prof. M. Isserlin (Munich), Prof. H. Pernot (Paris), Prof. E. W. Scripture (Vienna), and Prof. E. W. Selmer (Oslo). From England, Mr. R. T. Beatty (Teddington), Frl. Janvrin, and Mr. Stephen Jones (London) are taking part. Apparatus for film projection and an epidiascope are at the disposal of lecturers, and there will be an exhibition of apparatus of all kinds which it is expected will interest physicists, doctors, dentists, linguists, philologists, psychologists, and pedagogues as well as phoneticists. Inquiries are to be addressed to the Phonetic Institute of the University of Bonn, Poppelsdorfer Allee 25, or in London to the Secretarial Bureau of the International Society at 73, Welbeck-street, W. 1. With the announcement of the meeting reaches us a notice of the *Zeitschrift für Experimental-phonetik*, edited by Prof. Scripture, as the organ of the society. The journal—of which the first number will appear on June 1st—is the official intelligencer of institutes and laboratories in 10 or 12 countries. Membership of the International Society costs 10 marks yearly and entitles the member to receive the *Zeitschrift*.

INVALID CHILDREN'S AID ASSOCIATION.

AT the recent annual meeting of the Association, held at 18, Carlton House Terrace, under the presidency of Lord Goschen, Mr. H. S. Souttar remarked on the enormous development in effectiveness of both medicine and surgery which had taken place in the last 40 years. In his own student days large numbers of children suffering from surgical forms of tuberculosis were seen in hospitals; these cases had now virtually disappeared. The Association's work, however, was growing with the growth of London, and there were 39 branches in London, in addition to the central depôt. The service given depended essentially on personal help, and an increased number of trained workers were needed to deal with the extra cases. Lieut-Col. F. E. Fremantle referred to the beneficial effect which the Local Government Act might have on the work of the Association. (1) The system of one block grant from the State to local authorities would enable the authorities to budget in proportion to the various requirements; (2) a shrewd arrangement had been devised by which the more needy districts would receive the larger grants; (3) the Government had prepared in great detail a maternity and child welfare scheme for London, and it was a duty of all local authorities to submit a scheme, and to make use of voluntary organisations, stating what their contributions to them were to be; (4) an improvement in the provision for mothers and children should be affected in the course of the next ten years, by the reorganisation of institutions formerly under boards of guardians.

PUBLIC LODGING-HOUSES FOR WOMEN.

To the Editor of THE LANCET.

SIR,—I should be grateful if you would once more permit me to draw your attention to the progress of Cecil Houses. On Friday, May 30th, at 3 P.M., we are holding a public meeting at the Shaftesbury Theatre (by kind permission of Mr. Tom Miller and Basil Foster) to raise further funds. We have already three houses established and are opening a fourth very shortly, where for a shilling a night a homeless woman can get a good bed, hot bath, tea and bread and butter, and no questions are asked. We can accommodate 160 women and 34 babies every night—the charge for a cot is 3*d*.—but these resources do not nearly meet the perpetually increasing demand for beds consequent on the continual stream of women from the provinces and those thrown on the street through the housing shortage. Every night women—some of them with young children—have to be turned away through lack of room. If we are to start another house before next winter, we must raise the money required for the purchase of freehold, reconstruction, and equipment. Once the initial cost has been met, each house is entirely self-supporting, paying its own way on the shillings received nightly. Lieut.-Colonel Robert Loraine, D.S.O., is taking the chair for us, and the speakers will include Miss Marion Lorne, Miss Ellen Wilkinson, M.P., Dr. Morton (Governor of Holloway Prison), Mr. R. C. Sherriff, and Major J. Brunel Cohen, M.P. Tickets of admission to the meeting can be obtained (free) on application to me at Cecil Houses (Inc.), 11, Golden-square, London, W.1.

I am, Sir, yours faithfully,

A. E. CHESTERTON,

May 19th, 1930. Hon. Organising Secretary.

HEALTH REGAINED IN SOUTH AFRICA.

To the Editor of THE LANCET.

SIR,—I am writing in the hope of bringing a ray of hope to some of my fellow countrymen. About 37 years ago I had an attack of pleurisy while living in Hampstead, followed about two years later by hæmorrhages, culminating in breaking down of lung tissue, in short, tuberculosis—a common history. Sir Douglas Powell advised South Africa with the usual reservations in regard to comfort and altitude. I arrived in Natal and found the coast climate there worse than in England. I quickly found it was necessary to live above what is called in Natal "the mist belt," and proceeded to East Griqualand, about 5000 above sea-level, where I improved rapidly but still had the painful adhesions. After another short period in Natal, with a recrudescence of symptoms, I came to the Orange Free State where I am now farming and capable of a good day's work. I look and feel robust and adhesions are a thing of the past. People not too strong in the chest are frequently sent to Switzerland, but it is necessary for them to go where they will not only regain health but find a means of livelihood at hand. I live five miles from the nearest village, 16 miles from the railway. There is a telephone on the farm; the scenery is glorious, plenty of near neighbours, good motor roads, and every convenience. Land costs about £5 an acre and 500 to 1000 acres with sheep, dairy, and the usual agriculture are ample to support a family. There are cheese factories in plenty to send the milk to. I hope this letter may help some people to realise that South Africa is no longer the back of beyond.

I am, Sir, yours faithfully,

April 20th. H. H. T.

NEW PREPARATIONS.

CAROTENE.—We have received from the British Drug Houses, Ltd., Graham-street, City-road, London, N., a sample bottle of 50 pellets of carotene, which, as a source of vitamin A, has been brought forward prominently in connexion with the work of Prof. Edward Mellanby and Dr. H. N. Green. Each pellet contains 2 mg. of pure crystalline carotene in stable combination. Carotene is widely present in various foodstuffs, but this preparation has been put up in convenient form in order that medical men who desire to submit it to clinical trial may do so by administering it by itself. In THE LANCET recently (April 26th, p. 925), in referring to the work of Mellanby, it was pointed out that within the last two years the whole question of the relation of carotene to vitamin A has come under consideration, and there is now no conflict of opinion that purified carotene can act as a vitamin, though exactly how this occurs has not been ascertained.

SOLUGA (Savory and Moore, Ltd., and John Bell and Croyden, New Bond-street, and Wigmore-street, London, W.).—This preparation, which is put on the market as a concentrated food tonic, contains in definite proportions hormones, albumins, and lipoids derived from the liver, heart, brain, thymus, and central nervous system, combined with stable forms of vitamins, vegetable proteins, and maltose and grape sugar. The preparation is manufactured in Germany, and on the small tins in which it is supplied there is printed a full analysis of the contents. The drug can be taken dry, or followed by water, milk, or cocoa, or mixed with those liquids in indicated doses, but overheating, it is easy to see, would destroy some of its properties, and a warning is given to that effect.

OPOCALCIUM.—From the Continental Laboratories, Ltd., 17, Lower Belgrave-street, London, S.W., we have received a specimen box of 50 tablets (comprimés), containing parathyroid, suprarenal, and thymus extracts in combination with, among other things, calcium and magnesium. There is clinical evidence that the regular use of these tablets has been of service in the debility which follows overwork or which is marked in the convalescing stages after long illness. The doses are regulated according to the age of the patient and the persistence of the symptoms.

Lettsomian Lectures

ON

ENLARGED PROSTATE AND PROSTATECTOMY.

Delivered before the Medical Society of London

BY SIR JOHN THOMSON-WALKER, O.B.E., M.B. EDIN., F.R.C.S. ENG.,

CONSULTING UROLOGIST TO KING'S COLLEGE HOSPITAL; SURGEON TO ST. PETER'S HOSPITAL.

LECTURE I.

(Delivered on Feb. 17th.)

THE beginning of prostatic surgery, as we know and practise it to-day, is found in the work of McGill, of Leeds, and Belfield, of Chicago. At the time when McGill first advocated the suprapubic operation, it was generally accepted that a considerable proportion—estimated at about 30 per cent.—of all men over 55 had prostatic glands of an abnormally large size, but only about 50 per cent. of these had any symptoms that required attention. So long as there was no distressing frequency of micturition, due to infection of the bladder, or partial or total retention of urine, the enlargement of the organ might be disregarded; but infection and retention demanded surgical aid and this was afforded in the occasional or the habitual passage of the catheter. "The orthodox treatment of enlarged prostate," wrote McGill,[1] "may be discussed in a few words. Teach the patient how to pass a soft catheter for himself and let him pass it once or twice a day. When the treatment is successful nothing more is required." The introduction by Mercier of the coudé or curved gum-elastic catheter was hailed by Teevan in the Lettsomian lectures of 1880 as a great step in the treatment of these cases. Previously English gum-elastic catheters, suitably bent, were carried in a mahogany case. "Now," said Teevan,[2] "all this cumbersome apparatus is done away with and patients carry in their walking-sticks or umbrella-sticks but one catheter."

Catheter treatment was not always successful. In certain cases the difficulty of a much-distorted prostatic urethra or the inability of the patient to learn prevented the adoption of this method. In other cases the method broke down after a time owing to the increased difficulty in catheterism or the greater frequency with which the catheter had to be passed from infection of the urine. In acute retention of urine the failure to pass the catheter was dealt with in several ways. A metal catheter might be forced through the obstruction, tearing through the prostate and forming a new channel. This was termed "tunnelling the prostate" and was not regarded with favour by the more orthodox surgeons. Tapping the bladder with a metal trocar and cannula above the pubes, in the perineum or through the rectum, were the common methods, although the latter route was not recommended by the best authorities. In the chronic cases, where the intermittent passage of the catheter had failed, several methods were open for trial. A catheter retained in the urethra for a week or more was highly spoken of by Reginald Harrison.[3] In early cases dilatation of the prostatic urethra by special dilators was advocated by some surgeons. Two methods of incising the obstructing part of the neck of the bladder by way of the urethra were open for trial. Mercier[4] 32 years before and Guthrie at an earlier date had practised section by means of a prostatectome or concealed knife passed through the urethra into the bladder, while Bottini[5] had revived and improved the method introduced by Amussat, in which an obstructing bar was divided by means of an electric cautery passed through the urethra. These two methods of incising or cutting a wedge from the obstructing prostate at the neck of the bladder have, through many vicissitudes, survived to the present day, and are practised by a few surgeons in selected cases. The punch operation of Young[6] and "forage de la prostate" as practised by Luys[7] with the high-frequency cautery are the same operations that were practised with less perfect instruments in the day of McGill. Perineal cystotomy as a temporary measure was advocated by some surgeons. To this was added dilatation of the prostatic urethra and section of the obstructing portion at the neck of the bladder with the object of obtaining a more permanent result. Gouley,[8] of New York, claimed priority in this operation. Harrison[3] advocated it but followed it with drainage by the perineum through a stout tube for 6 to 12 weeks. Sir Henry Thompson had used suprapubic puncture as a temporary measure in cases of failure of catheter life in enlarged prostate.

There had been removals of the prostate by the suprapubic route before the time of McGill and Belfield. The French surgeon Amussat[9] had removed the enlarged middle lobe with scissors by this route in 1836; Billroth[10] and Dittel[11] in 1885, and Benno Schmidt[12] and Trendelenburg[13] in 1886, had performed similar operations. But these were isolated cases, and at the period we are now considering there was no body of opinion favourable to removal of the enlarged prostate, either by the perineal or by the suprapubic route. There was, moreover, a powerful influence which militated against any attempt to cure cases of enlarged prostate by radical operation. Two great figures in the surgical world—namely, Guyon of Paris and Sir Henry Thompson of London—were opposed to all radical operation on the enlarged prostate. The view that these eminent authorities held was that, in cases of enlargement of the prostate gland when catheter life had been fully tried and had failed, the bladder was atonic from prolonged obstruction and disuse, and would not regain its expelling power even if the obstruction were removed. These views were decisive in restraining surgeons from attempting the radical cure by operation of retention due to enlargement of the prostate.

MCGILL'S OPERATION.

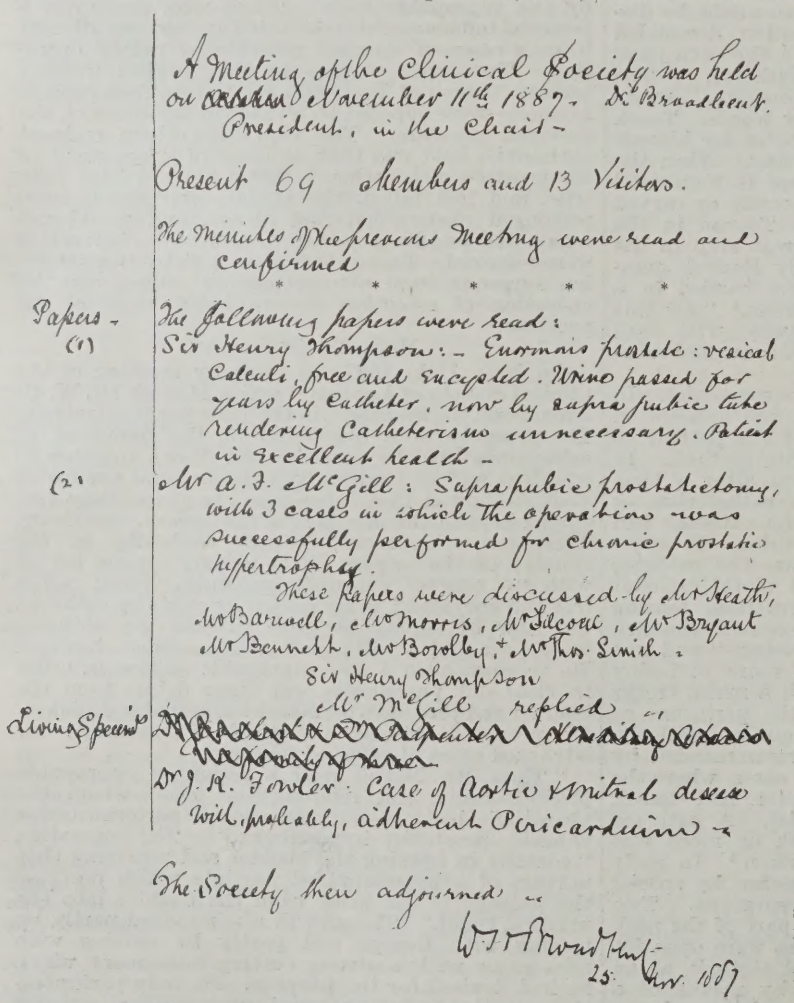
On Nov. 11th, 1887, an ordinary meeting of the Clinical Society of London[14] was held, with Dr. W. H. Broadbent, the President, in the chair (see illustration). The prospect of a discussion on the treatment of enlargement of the prostate had drawn together 69 members and 13 visitors, and the unusual number of visitors showed that interest in the proceedings had spread beyond the members of the society. Sir Henry Thompson, the most eminent authority in the country on the surgery of the urinary organs, led off with "a case of enormous prostate, vesical calculi free and encysted; urine passed for years by catheter, but now by suprapubic tube without any catheter for a year and a half; patient in excellent health." He recommended a free suprapubic section in order to clear out phosphatic and other debris from the bladder and provide a permanent suprapubic drainage. He proposed this as a method of treatment for advanced cases of enlarged prostate.

"Then Mr. McGill read a paper on suprapubic prostatectomy, and related three cases where the operation had been successfully performed for chronic prostatic hypertrophy." The operation "consists in opening the bladder and removing that portion of a hypertrophied prostate which prevents the passage of the urine from the bladder into the urethral canal." The growth was removed partly by tearing with forceps and partly by cutting with scissors or with a strong cutting instrument which he had devised for the purpose. He only performed the operation in cases of great urgency where catheter life had broken down. "The operation aimed not only at removing acute symptoms but at affording

permanent relief." Here then was a new idea. The removal of a portion of the prostate was to relieve the obstruction; the bladder muscle would regain its functional activity, and the organ would empty itself naturally. This was to be no palliation or temporary relief such as was the best that other methods could offer, but permanent cure was aimed at. This was indeed flying in the face of authority!

Sir Henry Thompson was present, and a few minutes before had described the method of permanent suprapubic drainage which he had introduced as a new and improved method of treatment. His views on the uselessness of removing the obstruction were well known. It is interesting to see how he took it. I can imagine there was a tense moment when he rose at the end of the debate. He was "much interested in Mr. McGill's operation and gratified by its results." The procedure was a "fresh starting point" and he "should further enquire into it." But there was the spectre of the atonic bladder and he reiterated his well-known views on this subject. Possibly in earlier cases there was an opening for the procedure, but he said this "without endorsing the operation." McGill in reply spoke of the difficulty in removing more than "minute fragments" of the prostate. He agreed in part with Sir Henry Thompson about atony. "Doubtless Sir Henry Thompson was right in placing a limit of time after which the operation would prove useless as a result of the atony of the bladder contingent on the long-standing prostatic disease."

This was in November, 1887. In September, 1886, about a year previously, Dr. W. T. Belfield,[15] of Chicago, had published a short note on a case in which he performed suprapubic cystotomy for two large calculi in a case of enlarged prostate. He mentions rather casually that: "The patient was so collapsed that no attempt was made to remove the prostatic outgrowth which could have been accomplished without much difficulty." The following year he was more successful. At the Chicago Medical Society on Feb. 7th, 1887, Belfield[16] showed a man, aged 73, who had been dependent on the catheter for a year. "Exploration of the bladder by a suprapubic incision revealed a solid prostatic outgrowth or middle lobe as large as a hazel nut. The pedicle was twisted off with forceps and the growth was removed. . . . The patient has since micturated freely without a catheter and can now almost completely empty his bladder." Another similar case followed in March, 1888. McGill[17 18] was unaware at the time he published his first case that Belfield had performed this operation. In all his subsequent articles he fully acknowledges the priority of Belfield's case. "Before I conclude, it is right that I should state that Dr. Belfield, of Chicago, is, so far as I know, the surgeon who first performed the operation which I have been describing." This case detracts in no way from the importance of McGill's work. The operation which Belfield so courageously undertook was a sporadic effort which does not appear to have attracted much attention, and which alone would have had little influence on the general trend of surgical thought on the subject. The work of McGill was an organised campaign against the prevailing views and in favour of a bolder and a progressive policy of cure of the retention of urine caused by enlargement of the prostate.



A Meeting of the Clinical Society was held on Friday November 11th 1887. Dr Broadbent President, in the Chair.

Present 69 Members and 13 Visitors.

The Minutes of the previous Meeting were read and confirmed

* * * * *

Papers. The following papers were read:

(1) Sir Henry Thompson:— Enormous prostate: vesical Calculi, free and encysted. Urine passed for years by Catheter, now by supra pubic tube rendering Catheterism unnecessary. Patient in excellent health.

(2) Mr A. J. McGill: Suprapubic prostatectomy, with 3 cases in which the operation was successfully performed for chronic prostatic hypertrophy.

These Papers were discussed by Mr Heath, Mr Barwell, Mr Morris, Mr Silcock, Mr Bryant Mr Bennett, Mr Bowlby, & Mr Thos. Smith.

Sir Henry Thompson

Mr McGill replied.

Living Specimens [illegible]

Dr J. K. Fowler: Case of Aortic & Mitral disease with, probably, adherent Pericardium.

The Society then adjourned.

W. H. Broadbent

25 Nov. 1887

Minutes of meeting of the Clinical Society of London, Nov. 11th, 1887, at which McGill's first cases of prostatectomy were presented and discussed.

(*Reproduced by permission of the Royal Society of Medicine.*)

McGill's conception of the anatomy of the condition which he proposed to attack was set out with admirable clearness in his writings. He recognises two parts of an enlarged prostate—namely, the part which lies within the bladder, having passed through the internal meatus, and the part which lies outside the bladder in the normal position of the gland. The former he terms the intravesical portion, the latter the rectal portion. He is quite clear as to what and where the seat of obstruction is. "Prostatic enlargements which give rise to urinary symptoms are intravesical and not rectal," and in none of his writings does he depart from this view. "Retention is caused by a valve-like action of the intravesical prostate, the urethral orifice being closed more or less completely by the contraction of the bladder on its contents." Treatment of these conditions, to be effectual, should drain the bladder for a time and remove the cause of the obstruction. How is the obstructing portion of the prostate to be removed? His first three operations, from his own description, must have been rather rough and-tumble affairs without any definite method. It is a piecemeal removal of the growth, partly by tearing with forceps and partly by cutting with scissors or with a strong cutting instrument designed for the purpose. "This is a tedious and not very elegant proceeding; it will, if the operation prove a useful one, probably be improved."

The following year he has got his operation all arranged, and at the Leeds post-graduate course

describes it in detail. "The operation consists of two parts: (1) the opening of the bladder, and (2) the removal of the prostatic valve which prevents the egress of the urine." The removal of the prostatic valve interests us most. We know what the prostatic valve means to McGill. It is the intravesical enlargement of the prostate. A pedunculated middle lobe can obviously be removed with ease, its pedicle being divided with curved scissors. A sessile middle lobe can be removed in the same way, helping the scissors by tearing with forceps. A collar enlargement is removed with greater difficulty. "Care must be taken not to leave any part of the projecting valve untreated." Then he sees that the urethra is patent by passing his finger as far as the first joint into its canal. This is the only description McGill gave of the operation he performed. McGill, as he hoped, improved his technique. The tearing with forceps and cutting with scissors was replaced as far as possible by enucleation with the finger.

How much of the enlarged prostate did McGill remove? There has been a great deal of discussion on this subject, and most of it arose when Freyer, 11 years after McGill's death, claimed to have introduced a new operation by which he removed the whole of the prostate in its capsule. Let us take McGill as his own witness. McGill's descriptions of his operation make it quite clear that he intended to remove only the intravesical portion of the enlarged prostate. There was no object, holding the views he did, in removing anything more. The use of the word "prostatectomy" has led to some misunderstanding. McGill did not claim that prostatectomy meant the total removal of the enlarged gland. "If," he says, "an increased and more prolonged experience shows us that the removal of a portion of the prostate enables patients to dispense with the use of the catheter, we shall have gained a step in the treatment of this condition." Nor did McGill's colleagues and contemporaries regard the operation as anything but a partial removal of the enlarged prostate. His colleague, Mayo Robson, writes thus in support of McGill's operation: "To those who have not done the operation or seen it performed it would seem to be a very formidable matter to remove part of the prostate, but the operation is really simple and more easy than the description would lead one to suppose." At the meeting of the British Medical Association at Leeds in 1889, Reginald Harrison, always a staunch supporter of McGill, opened the discussion on McGill's address as follows. "It appears to me that the suprapubic operation of partial prostatectomy will occupy a permanent place in the operating surgery of this organ." This seems clear enough, but lest the word "prostatectomy" should be misconstrued we have the comment of Belfield in 1890 on its use to guide us. "The obvious etymological inaccuracy of this term is still of slight moment since the real "prostatectomy," extirpation of the entire prostate, is as yet a rare experiment."

McGill's Cases.

In 9 of the 12 cases that McGill published the material removed was very small and was likened to a walnut, a bean, or a small pea. McGill himself referred to the difficulty in getting any but "minute fragments." Two of the cases operated on were obviously malignant and he could not, if he would, have removed the prostate by the method he was using. Three of his cases, however, call for our careful attention—namely, Nos. 9, 18, and 22 in his list. In Case 9 he removed seven pieces of enlarged prostate, weighing altogether 2 oz. 30 grs. I do not think that any surgeon nowadays would consider he had removed the whole prostate if he dug out seven pieces; he would know quite well that he was shelling out separate adenomata, and McGill does not tell us that this went any further than the description of the operations given in the text. In Case 22 he removed the enlarged lateral lobes, the size of a small walnut. McGill employed the term "lateral lobes" in his writings to express the intravesical projection of the lateral lobes, and there is no proof here that he went further than his description of his operation. Case 18 was a different type. "Portions of prostate weighing 2 oz. 40 grs. which surrounded the urethra laterally and below were enucleated in one piece." Here we have a specimen, the description of which resembles very closely that of many of the prostates removed by the methods at present in use. By the courtesy of Mr. J. F. Dobson I was permitted to inspect the historical specimens of enlarged prostate preserved in the museum of the Leeds University. It appears quite clear to me that, with one exception, the specimens of the McGill period represent portions of enlarged prostate and not the whole prostate in the sense that we use the term to-day. No. F.150 "remounted," which corresponds to No. 18 in McGill's list, is different from the others. Comparing it with a modern enucleated prostate, it resembles a medium-sized specimen of the "open variety." The lobes are continuous posteriorly and open along the anterior commissure. The surface is rough, but not more so than that of many of the modern enucleated prostates. If we are to speak of complete prostatectomy, this specimen should certainly rank as a complete enucleation of the prostate.

Did McGill set out knowingly in "a patient obviously dying if left alone" to do a new and more formidable operation than he had described in any of his writings? I think not. He was too good a surgeon to venture on this, and, moreover, he would have described the change in his procedure in the accompanying or subsequent papers. After a careful study of McGill's writings I do not see any evidence that he changed his view that the intravesical portion of the enlarged prostate was the cause of the obstruction he set out to treat and that the removal of the intravesical portion was what he aimed at and was all that was necessary. It has, I think, been claimed that McGill, recognising that he removed the whole of the extravesical portion of the enlarged prostate, adopted the operation of total enucleation of the prostate. Specimens removed subsequent to No. 18, and the absence of any such description in his subsequent writings, do not encourage us to accept this idea, and Mayo Robson's statement criticising Freyer's claims shows plainly that his colleagues did not consider that he removed the whole prostate. McGill died in 1890 at the early age of 40 years. It would be idle to speculate what developments would have been seen at that time had he lived to complete his work, or had his colleagues, with specimen No. 18 and McGill's example before them, had the faith to persevere.

The Perineal Operation.

The first note of dissatisfaction with the operation described by McGill comes from Belfield [19] in Chicago in November, 1890. He has reviewed the cases of suprapubic prostatectomy, which has been performed over 80 times, but he finds that "in nearly one-third of cases on record the radical operation failed to restore voluntary urination," and he harks back to the idea of bladder atony. But he detects another cause for the want of success in these cases. "The intravesical projection may in a given case constitute but a part of the prostatic obstruction," and "the discovery and removal of such outgrowths are not necessarily a complete operation." The prostatic urethra should be stretched and explored by the finger and the discovery of a hard mass or rigid ring should be the signal for perineal urethrotomy and incision or excision of the resisting tissue and thorough stretching. Kümmel, of Hamburg, had the same experience of McGill's operation, and to overcome it he supplemented the suprapubic excision of tumours by sinking the cautery into the prostatic substance.

Gouley,[20] of New York, was the first surgeon to lay down a formulated plan for perineal prostatectomy (1873). The intravesical enlargement of the prostate is first explored through an external perineal

urethrotomy wound. If a median outgrowth or isolated tumours are discovered the prostatic urethra is dilated and incised laterally and the outgrowths removed, preferably by an écraseur. Harrison [21] recommended a similar operation with subsequent prolonged drainage. Henry Morris took part in the discussion on McGill's cases at the Clinical Society in 1887, and he favoured the perineal in place of the suprapubic route. It was probably on the same afternoon or the next day that McGill visited Morris at the Middlesex Hospital, and Morris [22] tried unsuccessfully to convince him that the perineal route was the better.

The first carefully planned perineal operation for the removal of the whole of the enlarged prostate was done by Zuckerkandl [23] in Vienna in 1889. He made a curved prerectal incision, exposed the posterior surface of the organ, incised the prostatic urethra, and dissected the lateral lobes.

Castration.

The year 1893 was to see one of those dramatic changes in the treatment of the enlarged prostate that make the history of the subject so fascinating. Dr. J. William White, of Philadelphia,[24] read a paper at the meeting of the American Surgical Association at Buffalo on "the present position of the surgery of the hypertrophied prostate." White favours something less than the removal of the whole intravesical portion, hoping that shrinkage of the rest will take place after the analogy of the removal of a portion of the tonsil. But he notes that in about 20 per cent. of the suprapubic operations the bladder does not regain its power. At the end of an able address comes the idea that for some years almost banished prostatectomy from surgical practice. "It occurred to me some time ago that possibly the analogy between uterine fibromyomata and prostatic overgrowth was a real one. Castration might have the same effect upon the latter that oöphorectomy does upon the former and cause a shrinkage or atrophy that would result in the practical disappearance of the obstruction. I might add, finally, that I have not had the courage of my convictions, and have never seriously sought to recommend the operation." Surely no suggestion could be more moderately and tentatively put forward. White must have been surprised at the ready response of surgeons to his suggestion. Others were not so diffident as he, and the operation of castration as a method of treatment for prostatic obstruction was rapidly taken up everywhere.

It is difficult to explain this sudden and practically universal change of opinion if prostatectomy as then practised was a reasonably successful operation. The mortality of suprapubic prostatectomy in McGill's table of 24 cases was 16·6 per cent., and Belfield places the mortality of the operation in 1890 at 13·6 per cent. When it is remembered that cases of enlarged prostate were only operated on when catheter treatment had failed, owing to sepsis or the impossibility of passing a catheter, the mortality is remarkably low, although the weaker ones had probably been weeded out by septic catheterisation. Some other cause than high mortality must have prepared the way for the sudden change of opinion. This was to be found in the late results of the operations then practised. The proportion of cases where the bladder did not regain its power or quickly relapsed after operation was at least 20 per cent. It is likely also that the difficulty of the suprapubic operation had an influence. Surgeons at that time were not so familiar as they became later with the suprapubic route.

White had predecessors in the theory and practice of castration for enlarged prostate, although he did not know of them. Tupper, according to Walker,[25] performed orchidectomy with the object of relieving prostatic obstruction on two occasions—namely, in 1882 and 1886. Ramm, of Christiania,[26] operated on two men in 1893. Mears [27] (1893) suggested vasectomy or section of the vas deferens as a less severe and mutilating operation, and a number of surgeons took up the operation and published cases. Mental disturbance was observed after castration in 4 to 6 per cent. of cases, and in this respect the operations of vasectomy and castration were about on the same footing. Wood [28] and Horwitz [29] published lists of cases showing favourable results from castration in suitable cases. Harrison [30] (1900) and Rovsing [31] (1902) recorded cases of vasectomy resulting in cure or improvement. But in spite of the advocacy of many surgeons and the tables of satisfactory results that were published, these indirect operations began to lose their hold on practical surgeons. There were many reasons for this. The mortality which White had expected would be negligible was high (19·4 per cent., Cabot); the mutilation was such that only outstanding success could justify it, and favourable results were to be expected only in a proportion of carefully selected cases. While some improvement took place in suitable cases in a few days, in other cases months elapsed before any change could be detected. Whatever could be expected from a diminution of congestion might be obtained, but whatever might be gained by permanent shrinkage of the prostate was problematical. The number of cases of mental disturbance after castration was very disturbing, and it mattered little that other operations were followed by mental disturbance in feeble old men. White,[32] in a retrospect in 1904, says rather pathetically: "Doubtless many surgeons, probably most surgeons, would to-day dismiss castration and vasectomy from consideration, as summarily as I have rejected interstitial injections or transrectal galvanism. It may be that they are entirely right."

Two important articles on prostatectomy appeared during the early part of the period of indirect operations, and after that, apart from a few unimportant articles, there was silence. One was by Nicoll,[33] of Glasgow, on perineal prostatectomy in 1894, and the other by Fuller,[34] of New York, in 1895. Nicoll recognised the weak point in the perineal operation—namely, the difficulty in getting the prostate well within reach of the perineum. The bladder was opened suprapubically and the prostate pushed down by the fingers of an assistant. The prostate was then exposed from the perineum, the rectum being displaced backwards. The prostatic capsule was incised and the prostate dissected off the urethra. This was the first deliberate attempt to overcome the difficulty of reaching the gland in the perineal operation. Later on, French surgeons were to attack and solve the difficulty in another way, but they based their work on that of Nicoll. In 1895 Fuller [34] summed up surgical opinion in regard to suprapubic prostatectomy and disagreed with it. The argument that the results to be expected from prostatectomy were "indefinite and unsatisfactory is a false one," and is based on cases where the removal of the hypertrophy was incomplete, no attempt having been made to remove the prostatic hypertrophies surrounding the prostatic urethra. "If, however, all the hypertrophies, median, lateral and round about the prostatic urethra are removed . . . the results, as far as the bladder is concerned are, barring mortality, satisfactory." This was a very important step in the attack on the enlarged prostate by the suprapubic route, but little if any attention was paid to it, so strongly did the idea of the indirect operation of White hold the attention of the surgical world. Here for the first time it was laid down that the routine operation of suprapubic prostatectomy must include the "hypertrophies" along the prostatic urethra—in other words, the extravesical or rectal enlargement as well as the intravesical projection.

THE FRENCH WORKERS.

The years 1900 and 1901 saw the renaissance of prostatic surgery. Prostatectomy, both by the perineal and by the suprapubic route, found new advocates, and expanded to become the routine method of treatment of prostatic obstruction. The

handicap of the perineal operation had been the difficulty of reaching the prostate by this route. Nicoll had clearly shown the way in 1894, and now the French surgeons attacked the subject afresh. Albarran [35] followed the subcapsular method of Nicoll, but without the suprapubic incision, and drainage was made from the perineum after reducing the redundant prostatic urethra. From this time for some years a number of instruments which served to depress the prostate during the dissection were introduced by Albarran, Fergusson,[36] Lydston,[37] Delbet, de Pezzer, Legueu,[38] and Young.[39] They all followed and gradually rendered more perfect the prostatic retractor or "desenclaveur" of Albarran, which consisted of a two-bladed staff with angled end passed through the perineum and into the bladder, the blades being then separated so that traction on the shaft drew the prostate down into the perineal wound. Proust [40] gave a very clear and detailed account of the perineal operation. The patient is placed in the inverted sitting position, and a transverse perineal incision made and the prerectal space opened up. A broad-bladed retractor draws the rectum backwards, and a small opening is made in the membranous urethra through which the prostatic retractor is introduced into the bladder. The prostatic urethra is opened for its whole length, and the two lobes are separated from the urethra and bladder-base with scissors. The urethra is partly sutured and the bladder drained through the opening. In America, Young,[41] of Baltimore, has been the chief advocate of the perineal operation, and it is due to his brilliant advocacy and fine record of results that perineal prostatectomy retains a place among American surgeons.

The Suprapubic Operation: Freyer.

In June, 1901, Mr. P. J. Freyer [42] published four cases of what he described as "a new and at first sight formidable operation for radical cure of the enlarged organ—namely, total extirpation of the prostate." He referred to the valuable work of Belfield and McGill, which he regarded as partial prostatectomy. "The first case was not approached with a view to performing a new operation. It was undertaken as a partial prostatectomy in the first instance." It was only after examining the tissue removed that he came to the conclusion that "the whole prostate in its capsule had been removed." Freyer believed that while the intravesical part of the enlarged prostate might cause obstruction, the extravesical or rectal portion of the enlarged prostate was equally the cause of obstruction, and might exist as a cause of retention without any intravesical enlargement. The operation that he recommended consisted in removing the entire prostate with its capsule, the line of separation lying between the capsule and the rectovesical sheath, the capsule being removed and the sheath remaining behind. At first he believed that he was able to preserve the urethra. Very soon, however, it became evident that the prostatic urethra was torn across and partly or completely removed with the prostate.

This conception of the aim which should be pursued in every case of prostatectomy was a new one. No hint of it appeared in any of McGill's writings. Fuller more nearly approaches Freyer's conception. He has the idea, more advanced than McGill or his followers, that the obstruction is extravesical as well as intravesical, and that it is necessary to remove the enlargements along the prostatic urethra. But he is still removing "as much as possible" from within the lobes. There is no ambition to remove the whole of the hypertrophied prostate within its capsule, such as Freyer set out to achieve. A spirited discussion followed the publication of Freyer's cases and his claim to have introduced a new operation. Only two objections of real importance emerge from a mass of verbiage. Firstly, the operation performed by Freyer was the same as that advocated by McGill, and, secondly, the operation that Freyer claimed to be performing could not be done and the patient survive. It is a sign of the confusion that existed among some of the disputants that both of these arguments, each destructive of the other, appeared in the same letter. After stating that the operation had been practised by the members of the staff of Leeds Infirmary for years, Mayo Robson continues: "I have no hesitation in describing Mr. Freyer's idea that he extirpates the prostate entirely in its capsule as impracticable from an anatomical point of view. Even if it were possible to take away the entire prostate, it would be unnecessary and undesirable, seeing that a removal of all the hypertrophies affects a cure of the disease."[43] This letter from Mayo Robson, McGill's chief protagonist, appears to me to be sufficiently convincing that the two operations described by McGill and Freyer were different in conception and different in performance.

The claims of Freyer aroused a new interest in the surgical anatomy of the prostate gland, and a number of investigations on this subject were published during the next ten years by Roberts,[44] Shattock,[45] Cuthbert Wallace,[46] and myself.[47] The two chief points of interest were the fate of the urethra and the line of cleavage in the enucleation. Shattock examined 12 of Freyer's specimens in 1903, and showed that in cases where Freyer had thought the urethra was preserved, the prostatic and sometimes the membranous urethra was removed with the prostate, and even in those specimens where the gland had been parted anteriorly with the object of preserving the urethra, the urethral and vesical mucosa was present in the specimen removed "Much of the interest in regard to the urethra," says Shattock, "is now gone, since its preservation is no longer regarded as of any moment." The second point was the removal of the entire enlarged prostate in its capsule. The structures composing the wall of the prostatic bed were the subject of investigation and discussion, principally by Cuthbert Wallace and myself. According to the view of the former, nodules of adenomata in the enlarging prostate pressed aside the prostatic tissue and formed a false capsule in which was embedded atrophied gland tubes, and these layers, which he represented as of considerable thickness, formed the wall of the prostatic bed, the operation consisting merely of shelling out adenomata from within the lobes of the prostate. My view, from examination of post-mortem specimens after prostatectomy, was that the wall of the prostatic bed was formed by thickened rectovesical fascia, and that any prostatic tissue found in it was accidental. I showed that the striped muscle of Henlé, which lies between the anterior commissure and the sheath carrying the prostatic veins, appeared in some of the enucleated prostates and marked the line of cleavage as immediately inside the fascial sheath. At a later date (1914) Wade [48] reviewed this subject, and found that the wall of the prostatic bed in eight cases examined after prostatectomy consisted of muscle and fibrous tissue and compressed gland acini. He saw one post-mortem specimen in which he believed that total extracapsular enucleation of the prostate gland had been accomplished, and stated that "cases, however, are not rare where partial extracapsular removal has been carried out" and, where the specimen is examined after removal, portions of striped muscle-fibre are found on its surface. The former statement agrees with the views of Wallace, the latter with those expressed by myself. It seems that many grades must exist between a thick mass of stroma and compressed gland tissue, and a thin partial layer covering the rectovesical fascia forming the lining of the prostatic bed. A corresponding difference will be seen between the specimens removed by different operators and in different cases.

The method described by Freyer was at once taken up by surgeons all over the world. Dramatic as had been the change in practice from McGill's operation to the method of indirect operations of White, the swing of opinion was still more striking when Freyer published his first cases. It was a matter for comment in the early cases of operation on the prostate that

bleeding was not more severe. Yet even in the early cases operated on by McGill, Robson, Teale, and Littlewood [49] we read of difficulties from hæmorrhage. In Freyer's cases, while he constantly demonstrated the absence or the control of hæmorrhage at the time of the operation, there was frequently trouble after the return of the patient to bed which was the source of grave anxiety.

Watching these cases, and with an increasing experience of my own, it became evident to me that hæmorrhage, if not the direct cause of death in many cases, was a predisposing factor. Further, I recognised that Freyer's view that the removal of the prostatic urethra was unattended by a risk of a traumatic stricture, while true in the majority of cases, was unfortunately subject to numerous exceptions, and that the traumatic stricture of the urethra which followed prostatectomy was of a nature very difficult to treat. A further aspect, in which the operation Freyer was performing fell far short of perfection, was post-operative sepsis, and I realised that among other points in technique a clean cavity, without capsular shreds or partly detached masses of gland tissue and mucosa, was necessary in order to prevent persistent infection after the operation. With these defects in view I introduced a method [50] of open operation, in the hope of preventing the occurrence of such complications. The operation was first tried early in 1916, and then in an increasing proportion of cases until the method became my routine practice. The operation avoids placing the finger in the rectum, and hæmorrhage is controlled by free exposure and ligature. All tags, flaps, and nodules that might cause sepsis or post-operative obstruction are removed, and the prostato-vesical orifice is opened up to prevent contraction.

I did not at that time, or indeed for a number of years later, know that there appeared in the collected papers of the Mayo Clinic [51] an illustration showing sutures introduced into the prostatic capsule. The legend of this illustration is "Prostatic capsule partially closed by interrupted sutures." There is no description of the operation. In 1917 there is a note by E. S. Judd, of the Mayo Clinic, of dissection of the prostate with the bladder-base exposed.

Attempts to shorten the convalescence and avoid the dangers of an open cystotomy wound after the operation by immediate closure of the bladder have been made by Ralph Thompson [52] and by Harris.[53] Harris sutures the posterior lip of the internal meatus to the posterior wall of the prostatic bed and partly closes the internal meatus on a catheter retained in the urethra. The cystotomy wound is then closed.

It will not be out of place here to note the death of Dr. W. J. Belfield, of Chicago, which took place on Oct. 4th, 1929. Dr. Robert H. Herbst, of Chicago, writes: "He was an interesting and forceful teacher, and an inspiration to younger men. He will be remembered as a scholar, a kind and willing counsellor, and a true friend."

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DIAGNOSIS OF DIABETES MELLITUS.

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SHORTLY after obtaining a qualifying degree some 30 years ago I found no difficulty in diagnosing diabetes mellitus. After 15 years of specialised study of that disease I have come to the conclusion that the accepted methods of diagnosis are fallacious, and that many patients said to be suffering from that complaint and treated as such would enjoy better health if they were allowed to eat whatever they desired. No responsible individual would make so sensational a statement unless he were able to supply conclusive evidence to support it. I trust that I shall be able to prove myself a responsible individual.

The first step is to supply a definition of diabetes mellitus, which for many reasons is far from easy. It is unfortunate that complex words convey different ideas to different individuals; before attempting a definition it is, therefore, absolutely necessary to find some basis of agreement. The derivation of the name diabetes mellitus is found in the Greek word διαβήτης = a syphon, and the Latin word mellitus, of honey. I think all will agree that if a patient is suffering from true diabetes mellitus and is not treated he must develop polyuria and glycosuria unless he die too soon from some intercurrent malady or accident. It is, however, obvious in the very early stages of the disease that the departure from normal may be so slight that the glycosuria may be intermittent and the polyuria may not have developed.

SIR J. THOMSON-WALKER: *References.*

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Now if the deterioration in the metabolism be arrested at this early stage, and if this occur without treatment, the question arises whether the patient should be said to be suffering from diabetes mellitus or whether some other term ought to be employed. Seeing that there are arguments in favour of and against the use of different names for the quiescent and progressive stages of diseases, it seems to me that there cannot be any general ruling on the question, but that each condition must be considered separately, depending upon the meaning of the name used. For instance, if an individual is infected with the bacillus of Koch and is said to be suffering from tuberculosis, it may be advantageous to refer to progressive and quiescent tuberculosis; but if one were to refer to the disease as "phthisis," which means wasting, then it would be unwise to say that the patient was suffering from quiescent phthisis. If the disease were quiescent the phthisis would not persist. The term diabetes mellitus to my mind corresponds more with the term phthisis than with tuberculosis, and therefore it should be reserved for the progressive disease and some other name be found for the stationary condition.

Years ago I suggested the name "hypoglycopyresis" to denote a diminished power of burning sugar. There are two objections to this word. (1) It is cacophonous. (2) The chief error in the metabolism may be a diminution in the power of storing sugar whilst that of burning carbohydrate may be unimpaired. An alternative term "stationary hyperglycæmic glycosuria" describes the peculiarity and conforms to the term orthoglycæmic glycosuria. In this paper I wish to emphasise the distinction between orthoglycæmic glycosuria or negligible glycosuria; stationary hyperglycæmic glycosuria or hypoglycopyresis; and progressive hyperglycæmic glycosuria or diabetes mellitus. The physiologist has little difficulty in framing a definition, and states that diabetes mellitus is due to an insufficiency of insulin. When it is pointed out to him that some cases of disease indistinguishable from diabetes mellitus are not benefited by the injection of insulin, he adds: "or when insulin is prevented from acting." At present, however, he is not able to supply any satisfactory explanation of the failure of insulin to act, therefore his definition is of greater academic interest than clinical value.

The definition I am about to offer is for the purpose of this paper, and I scarcely expect it to be accepted as a universal definition of the disease. "Diabetes mellitus is a disease due to a progressive deterioration of the metabolism, primarily of that of carbohydrates and secondarily of that of proteins and fats. This deterioration may progress steadily, sporadically or fulminatingly, and may by medical treatment be arrested or even reversed." The characteristics of the disease are a persistent hyperglycæmia following the absorption of carbohydrate; this hyperglycæmia is often associated with diuresis. Commonly ketosis occurs when the disease is advanced, because the katabolism of carbohydrates is so depressed that the metabolism of fats becomes deranged.

At the present day I need only mention, without going into any detail, that there are many substances besides dextrose which reduce copper when boiled in alkaline solution, and therefore the fact that the urine reduces Fehling's or Benedict's solution does not permit the conclusion that glycosuria is present. (Glycosuria indicates the presence of dextrose in the urine in a quantity recognisable by Benedict's test.) I believe also it is generally recognised that nearly 2 per cent. of true glycosurics are not suffering from any disease but have an unusually low renal threshold for dextrose. These do not develop hyperglycæmia after the absorption of carbohydrates, and are said to have an orthoglycæmic glycosuria. The majority of authors agree that this peculiarity may be disregarded, although a few express the view that persons with a low renal threshold for sugar are more likely to develop diabetes mellitus than those with the normal average threshold. I gather that in America some believe that a low renal threshold for dextrose protects the patient against diabetes mellitus. My own experience supports neither of these views, but rather tends to show that there is no relation between the threshold and diabetes mellitus, and that a low renal threshold for dextrose neither protects the individual from the disease, nor does it render him especially liable to it. I have seen at least three individuals with low renal thresholds develop diabetes mellitus, whilst amongst my cases of the disease only a very small percentage have low renal thresholds for dextrose, a proportion too insignificant to suggest that there is any actual relation between the two conditions. This latter argument would be rendered void if undoubted evidence could be produced to prove that the renal threshold rises after the development of diabetes mellitus.

The characteristic of diabetes mellitus is the persistence of hyperglycæmia for some time after the absorption of carbohydrate. It has been assumed in the past that all cases in which this persistent hyperglycæmia occurs are suffering from diabetes mellitus. This assumption is to me a logical fallacy almost as striking as saying: "All horses are quadrupeds, therefore all quadrupeds are horses." It is true that most patients who have definite diabetes mellitus develop a persistent hyperglycæmia after the absorption of sugar, but I hope to be able to prove it incorrect to assume that all who have this persistent hyperglycæmia are therefore suffering from that disease.

For the safety of patients of medical men who have not the facilities for studying their cases of glycosuria, a rule has been adopted that any patient whose urine reduces Fehling's solution shall be treated as a case of diabetes mellitus until he has been proved to be free from diabetes mellitus. This rule should never be followed by those who can investigate their cases. I adopted it and only recently have recognised how it has led me astray. In some ways it is like assuming that the accused man is guilty and making him prove his innocence. The majority of countries which adopted this law have realised that it caused more miscarriages of justice than when the individual was assumed to be innocent until proved guilty. There will be fewer errors in diagnosis if those of us who have facilities for investigation assume that cases of glycosuria are not cases of diabetes mellitus until we have evidence of that disease other than glycosuria and hyperglycæmia. In my opinion symptoms are of incalculable value, but the sugar-tolerance test is fallacious in the absence of symptoms, even when all the known errors are excluded most carefully.

Errors in the Sugar-tolerance Test.

The metabolism of an individual is not a constant and unalterable process; from time to time it changes in quantity as well as in quality. One of the most definite and dramatic ways of illustrating this fact is by giving a dog a dose of amyl cyanide. The effect on an average dog is negligible, but if that dog be given small doses of ethyl alcohol for a period and then a dose of amyl cyanide, it will die very quickly. The administration of the alcohol has altered the metabolism to such an extent that it has acquired the power of splitting the cyanide ion from the amyl ion, and the dog is promptly poisoned. Less striking changes occur in man on administering alcohol, nicotine, morphine, and many other substances. The power of storing and/or burning carbohydrate is modified in many ways. It has been found that the concentration of sugar in the blood after the administration of a definite dose of sugar rises higher when the individual is mentally fatigued than when he is rested.

All with experience have had opportunity of noting that the carbohydrate metabolism is depressed by anxiety, as summed up in the epigram: "On Wall Street when stocks go down sugar goes up." The metabolism is also influenced by the preceding activity of various organs. If a healthy man be

put upon a diet poor in carbohydrates for a period before a sugar-tolerance test, the concentration of sugar in his blood will rise higher and hyperglycæmia will persist longer than if he has been on ordinary diet for the preceding four days. The reverse also proves true: if a patient with a depressed carbohydrate metabolism fasts for some time before the test is made, the concentration of sugar in his blood will not reach so high nor persist so long as when he has been allowed an ordinary diet for the four days preceding the test. In other words, the fasted healthy man gives a curve which simulates the diabetic, and the diabetic gives a curve which simulates the healthy; therefore before carrying out a sugar-tolerance test with the object of making a diagnosis, the patient should be on an ordinary diet for some days.

Emotion and pain should be guarded against as far as possible. It is my custom to let the nurse take all specimens of blood, and not to see the patient myself on the day of the test until it has been completed. The blood should be collected as painlessly as possible, using a really sharp spring lancet.

Certain toxins depress the power of metabolising carbohydrate; therefore the test will not prove of value unless all known sources of infection are previously treated and eradicated. I think I was the first to draw attention to this some thirteen years ago. The commoner sites of infective foci are the gums, tonsils, antrum, skin, and bladder. Abscesses may lead to a temporary hyperglycæmia in individuals who fail to show any impairment in their carbohydrate metabolism, even when submitted to tests some weeks after the abscesses have healed.

Many observers attach much importance to the concentration of sugar in the blood after a fast of twelve hours, and hesitate to diagnose diabetes mellitus where this falls to 0·1 per cent. or below. I record one typical case in which this opinion would prove incorrect. The sugar-tolerance test has proved so fallacious in my experience that I have become very cautious in drawing conclusions based upon a single test.

There is another method of investigating patients who excrete sugar whilst on ordinary diet, and this also fails to distinguish between a congenital or acquired stationary hyperglycæmic glycosuria and the progressive condition. The patient is placed upon a diet poor in carbohydrate, which can be poor in energy too because it is not to be maintained for long—e.g., 30 g. of carbohydrate, 50 g. of protein, and 80 g. of fat. Taking the potential carbohydrate of protein as 58 per cent. and that of fat as 10 per cent., the total "G" in that diet would be 67 g. The urine is collected, mixed, and measured every 24 hours and the total quantity of dextrose excreted is estimated. This diet is maintained for three days, and then 30 g. of pure carbohydrate are added to it and continued for another three days. Three or more further additions are made, each of 30 gr. of carbohydrate, at intervals of three days. If the sugar excreted remain a constant percentage of that ingested, the diagnosis of diabetes mellitus is excluded, because a peculiarity of that complaint is that the more carbohydrate absorbed the less is utilised. This method again fails to differentiate between a case of early diabetes mellitus and one of stationary hyperglycæmic glycosuria.

Accurate Diagnosis.

It may be said with fairness that so far this paper is purely destructive, and that a fallacious method of diagnosis which may lead to occasional error is better than none at all. With this criticism I am in entire agreement; therefore I shall complete this article by stating the methods I adopt in attempting to arrive at an accurate diagnosis. My anxiety for making an accurate diagnosis must not be interpreted as any want of appreciation of the paramount importance of arriving at a conclusion as rapidly as possible. This is easy to understand, since my experience has shown that the chance of recovery from diabetes mellitus is dependent upon the brevity of the interval between the onset of the disease and the commencement of adequate treatment. When a patient presents himself with the symptoms of thirst, polyuria, and glycosuria, he may be suffering from diabetes mellitus, malignant disease of the pancreas, a tumour of the pituitary gland, or possibly diabetes insipidus together with a low renal threshold for dextrose. Hyperglycæmia would exclude diabetes insipidus. It is wise to assume that the patient is suffering from diabetes mellitus until some sign can be elicited suggesting that a tumour accounts for the hyperglycæmia. Very frequently patients who have never had symptoms seek advice stating that they have consulted several doctors and some have told them that they have sugar diabetes, whilst others have said that there was nothing the matter. It is my custom to explain to these that, however learned the physician they consult, it may not be possible for him to collect sufficient data at a single visit to permit him to arrive at a definite diagnosis; that it is not possible to draw a fine line between health and disease; and that when the departure from the normal average is but slight there is one way and one way only of deciding whether it is due to disease, and that is by finding out whether it is progressive.

If there be no necessity for an early diagnosis I rely upon the results of the sugar-tolerance tests taken at intervals, and refuse to diagnose diabetes mellitus in the absence of symptoms until I have evidence that either the power of storing and/or burning sugar is very much below the normal average or that the power is decreasing. If the time which can be allotted to the diagnosis is brief and the sugar-tolerance test equivocal, then I determine the effect of bacterial toxins upon the carbohydrate metabolism of the patient.

In the absence of symptoms, a diagnosis of diabetes mellitus may be made if, after 14 hours' fast, the concentration of sugar in the blood is above 0·2 per cent., or if, after the administration of 50 g. of dextrose, the sugar in the blood rises above 0·3 per cent. and remains above 0·2 per cent. for more than three hours after the sugar has been administered. If the concentration of sugar in the blood falls to 0·12 per cent. or to the level at which it started within two and a half hours, even if it has risen for a time to 0·3 per cent., or perhaps a little higher, the diagnosis should be only tentative in the total absence of symptoms. The patient should be allowed to remain on ordinary diet for an interval of six weeks if no symptoms develop, and then another test should be carried out, resembling the first in every detail. If the second test shows a very material diminution in the power of the patient to store sugar, then after a week's interval a third test should be made; but if the apparent deterioration be inappreciable the interval before the third test should be about three months. If the power of storing sugar has increased during the interval, the diagnosis of diabetes mellitus should be postponed; the judgment of the observer must be exercised to decide how many of these tests are essential. In the absence of symptoms the diagnosis of diabetes mellitus should be made only when evidence of a progressive deterioration of the metabolism has been established.

I believe most patients are willing to undergo quite a number of tests rather than limit their diets unnecessarily for an indefinite time. It is possible that the inclusion of the patients suffering from stationary hyperglycæmic glycosuria amongst the diabetics accounts to some extent for the alleged rapid increase of the incidence of the disease.

Another method of differentiating between stationary hyperglycæmic glycosuria and diabetes mellitus is by noting the effect of small doses of bacterial poisons on the concentration of sugar in the blood. More than 13 years ago I referred to the fact that some patients suffering from moderately severe diabetes mellitus were able to tolerate a much larger

diet after they had had septic foci extirpated from their gums. This observation has been confirmed times without number.

The effect of infection was driven home very forcibly many years ago by a girl of seven years who re-developed intense glycosuria whilst on a restricted diet which had controlled her glycosuria for several months. The incident was pathetic, because the little patient feared that she would be accused of having eaten something outside her diet which she knew was not the fact. On making inquiries, I learnt that her elder sister would be out of quarantine for varicella in four days' time. The recurrence of the glycosuria permitted me to venture the opinion that the patient would develop spots within a few days, a prophecy which proved correct.

This deterioration in the metabolism of a diabetic due to the absorption of bacterial toxins may sometimes be used to assist the diagnosis. A short time ago the gradual rise of the concentration of sugar in the blood of a patient with what was thought to be a subsiding appendicitis led to the decision that an operation ought not to be delayed, and thus the life of the patient was saved. If a dose of bacterial toxins, such as a vaccine against typhoid fever, be injected into a normal individual, there is a tendency for the concentration of sugar in the blood to fall, which may be due to poor absorption. In my limited experience, vaccines have led to a rise of sugar in the blood of patients suffering from diabetes mellitus, and even in those who have apparently recovered from that disease. In a really doubtful case this was tried with a negative effect, but it is too early yet to be certain that the patient's metabolism will not deteriorate as time passes. This method is merely a suggestion which so far has proved promising.

Owing to lack of data I am not in a position at present to state whether stationary hyperglycæmic glycosuria is associated with the complications which occur in diabetes mellitus, but it is obvious that if the view which is in vogue at the moment—that arterial degeneration in diabetes mellitus is due to an excess of fat in the diet—is correct, the patients who are permitted to continue a diet with a normal amount of carbohydrate may escape that devastating complication.

The evidence upon which the above statements are made consists of two series of cases; one giving sugar-tolerance tests which suggest that the patients are suffering from diabetes mellitus but in which the symptoms have not become any worse upon an unrestricted diet; and the other series consisting of cases which, although suffering from diabetes mellitus, give curves very far from suggestive of that disease.

CASE 1.—The first case which led me to realise that the accepted methods were not satisfactory was a spinster, aged about 31, who was nursing her brother, an alleged diabetic. After testing the urine of her brother she tested her own urine, and found that it reduced Fehling's solution. Although she had not suffered at any time from symptoms suggestive of diabetes mellitus, she was treated by a restricted diet, and was sent for further advice. After 14 hours' fast the sugar in her blood was 0·1 per cent., but the percentage rose to 0·25 within 90 minutes, and did not fall to 0·1 until more than three hours after the administration of the dextrose. A meal fairly rich in carbohydrate raised the sugar concentration in the blood above 0·20 per cent. I came to the conclusion that the patient was suffering from very mild diabetes mellitus. The circumstances made it unwise to tell her so or to limit her diet, and she was told to eat and drink whatever she liked for a year, and then present herself for re-examination. The test carried out in Scotland a year later showed that the power of storing sugar was practically normal. After an interval of yet another year the third test was made. The sugar in the blood then rose above 0·2 per cent., and aroused anxiety in the mind of one medical man, but the curve compared favourably with that obtained two years previously, and the patient continues to eat what she likes and to enjoy good health (Fig. 1). If she had been suffering from diabetes mellitus the disease would have made itself evident after two years of unrestricted diet.

CASE 2.—The second patient placed tentatively upon an unrestricted diet was the brother of the first; he was alleged to have been suffering from diabetes mellitus for five years, and had been treated during that time with a restricted diet. When submitted to a sugar-tolerance test the curve seemed to indicate that his power of storing sugar was below that of the average normal, but only slightly so. I concluded that if he were suffering from true diabetes mellitus and had been treated by diet only, that in all probability the disease would have made progress, therefore I advised him to eat whatever he liked for a year, and then have the test repeated. The test was not repeated, but from time to time I receive evidence that he has not developed hyperglycæmia, and that he has not shown any symptoms of diabetes mellitus (Fig. 2).

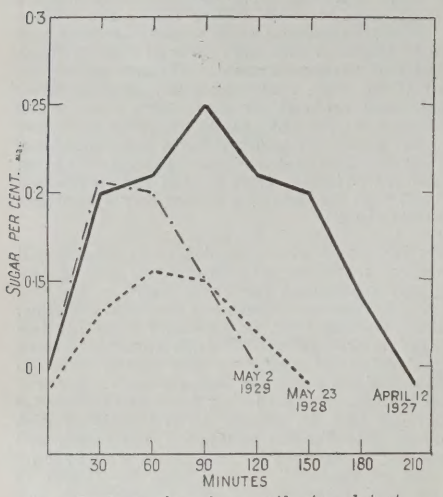
CASE 3.—These two cases were completely overshadowed by a third who gave a history of hæmoptysis during the last eight years and glycosuria for three years. He did not complain of any symptoms suggesting diabetes mellitus. On April 4th, 1927, having been on ordinary food for the previous four days, he was submitted to a sugar-tolerance test. The concentration of sugar in the blood rose to 0·3 per cent. and remained there for half an hour. I came to the conclusion that he was suffering from mild diabetes mellitus, and advised him to adhere to a restricted diet and report progress. He did not return for two years, and then told me that for 21 months he had eaten whatever he liked. A repetition of the test showed that his power of storing sugar had not deteriorated, and therefore in my opinion he was not suffering from diabetes mellitus. He is continuing with a normal diet (Fig. 3.).

CASE 4.—A man, aged 41, sought advice on Nov. 8th, 1927, because he felt out of sorts. His medical adviser found sugar in his urine. The patient did not complain of any symptoms suggesting diabetes mellitus and had insured his life two years previously, paying the standard premium. On Nov. 9th he was submitted to a sugar-tolerance test, and given 50 g. of dextrose by the mouth. The rise and fall of the concentration of sugar in the blood was within the normal average, but the urine secreted during the test contained 7·5 g. of dextrose, proving that the patient's renal threshold for sugar was below the average. I concluded that he had orthoglycæmic glycosuria, but since he had been free from glycosuria two years ago it seemed wise to keep him under observation. He was advised to eat and drink whatever he liked for a year, and then submit himself to another test. On June 13th, 1929, the test was repeated, and the concentration of sugar in the blood rose to 0·3 per cent., and remained there for half an hour. During this test 11 g. of sugar were excreted in the urine, whilst in the previous test 7·5 g. were excreted. Since the patient felt quite well and did not have any thirst I advised him to make no changes in his life, but warned him that he did not appear to be normal, and therefore he should be tested again comparatively soon. He did not return until Dec. 20th, when the test seemed to justify the advice given. The sugar excreted on this occasion was 5·1 g., which was less than on either of the earlier occasions (Fig. 4). He stated that he had never felt better in his life. He was advised to continue as in the past.

CASE 5.—A married woman, aged 40, had sugar found in the urine by her local medical adviser, who informed her that she was suffering from diabetes mellitus. She was submitted to the usual test on Oct. 4th, 1927; the result shown by the curve suggested some abnormality of the metabolism, although this was not proved. She was advised to modify her diet to a small extent, and from time to time samples of her blood were taken, and the concentration of sugar was estimated (Fig. 5). It was found that she could take 30 g. of carbohydrate at a meal without developing hyperglycæmia. In November, 1928, the test was repeated, and since it did not indicate any progress of the disease she was advised to eat whatever she liked for a time. When the test was repeated in May, 1929, the resulting curve seemed to indicate that the advice to return to an unlimited diet was bad, and that by throwing too much work upon the pancreas the disease had made considerable progress. Having had some experience of abnormal curves and learning that symptoms were completely absent, I advised an unlimited diet for another three months. During that time the patient continued to put on weight and gain strength, and when the test was carried out in August it was found that her power of storing and/or burning sugar was quite as good as when she had first consulted me close upon two years earlier. I contend that if I had followed the accepted rule this patient would have been diagnosed and treated as a case of diabetes mellitus.

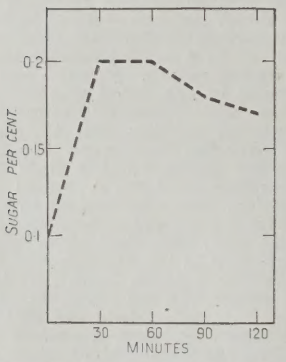
CASE 6.—A man, aged 45, was seen in October, 1923. He gave a history of glycosuria for eight years. He was content to live on a restricted diet, and was not submitted to a sugar-tolerance test until November, 1926, when he was given 30 g. of dextrose by the mouth. The test suggested

FIG. 1.



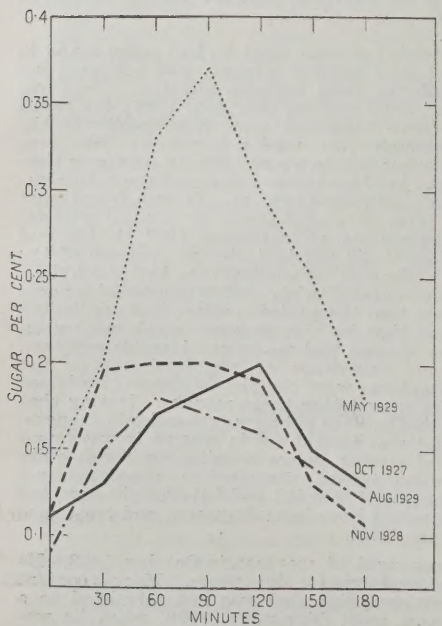
50 g. dextrose given by mouth at each test.

FIG. 2.



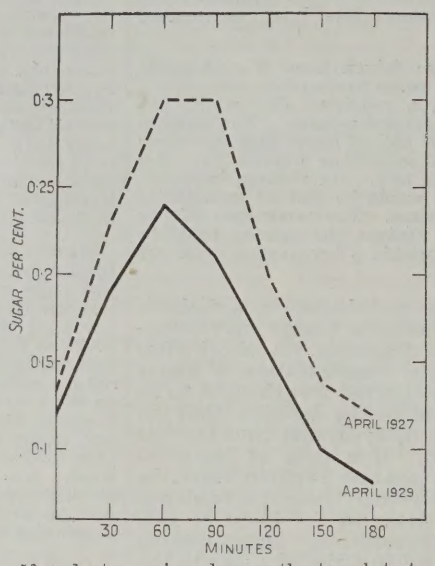
50 g. dextrose given by mouth.

FIG. 5.



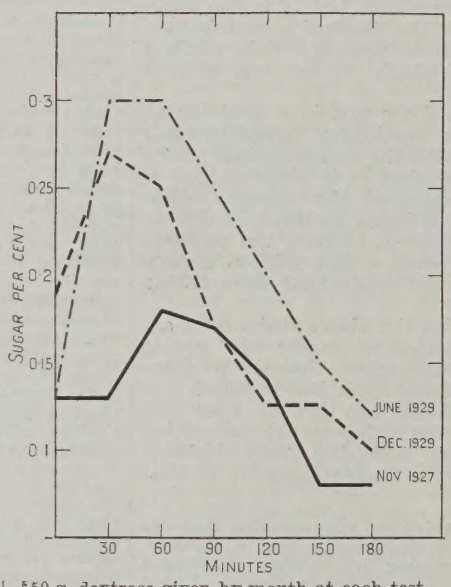
50 g. dextrose given by mouth at each test.

FIG. 3.



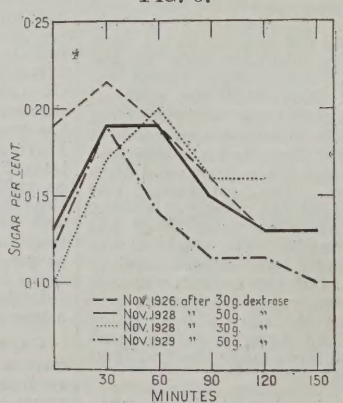
50 g. dextrose given by mouth at each test.

FIG. 4.



50 g. dextrose given by mouth at each test.

FIG. 6.



Dextrose given by mouth.

some impairment in the storing of sugar, and the patient was advised to continue his restricted diet. Two years later a similar test was made, and also another test with a dose of 50 g. of dextrose. By that time my experience was sufficient to allow me to advise the patient to eat and drink whatever he liked. The test carried out in November, 1929, shows that the advice was good (Fig. 6).

CASE 7.—A man, aged 56, sought advice for pains in the limbs. The diagnosis of diabetes mellitus had been made in 1918 by a very capable observer after the patient had been in a nursing home for three weeks. He had been put upon a restricted diet which he had kept for two years. For nine years before he consulted me he had eaten and drunk whatever he liked. In December, 1928, he was submitted to the test, the result of which is recorded in Fig. 7. I cannot help thinking that the curve obtained in 1918 could not have been much better than the one in 1929, otherwise the diagnosis of diabetes mellitus would not have been made. The nine years of unlimited diet had not led to any appreciable advance of the disease, and therefore this is a case which does not need treatment, and is not one of diabetes mellitus.

CASE 8.—A spinster, aged 40, had a family history of diabetes mellitus. Her symptoms had first appeared in August, 1928, and hyperglycæmia had been found. She was submitted to a sugar-tolerance test on Jan. 4th, 1929. The concentration of sugar began at 0·09 per cent. after 14 hours fast, and fell to 0·10 per cent. within two and a half hours (Fig. 8). This curve is not typical of diabetes mellitus; but there was no doubt that the patient was suffering from that complaint. A short time later she caught influenza, and required more than 20 units of insulin twice daily whilst on a diet of 80 g. of carbohydrate and 35 calories per kilogramme bodyweight per diem.

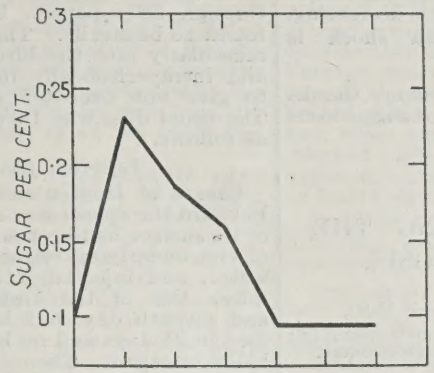
CASE 9.—A major, aged 40, was refused for life insurance on

account of glycosuria. A sugar-tolerance test on Oct. 19th, 1927, showed a poor power of storing sugar, but since the patient had been subjected to an anæsthetic comparatively recently, and he did not present any signs of diabetes mellitus, he was advised to take a holiday and to report in six weeks' time. Seven months later a second test was made, and then it was found that the curve was that of diabetes mellitus. The hyperglycæmia was verified on several occasions. Many tests of non-diabetic patients appear to record a poorer power of storing sugar than this patient possessed, demonstrating how unwise it is to attach too much importance to the sugar-tolerance test (Fig. 9).

CASE 10.—A man, aged 49, had had intermittent glycosuria for a short time, and was submitted to a sugar-tolerance test on July 1st, 1924. The concentration of sugar in the blood rose to 0·33 per cent., but fell to 0·125 per cent. within three hours. After three years of unrestricted diet the sugar in the blood at 4.30 P.M. one day was found to be 0·14 per cent. On June 5th, 1929, the patient was submitted to a sugar-tolerance test, which showed very considerable delay in the storing of sugar. The first curve might be described as the lag curve of Mac-Lean. It probably has nothing to do with delay in the activity of the pancreas, but is simply due to an absorption of sugar at a rate greater than the average (Fig. 10). The second curve suggests a slow development of diabetes mellitus, but the patient enjoys good health and has not shown any signs or symptoms of the disease.

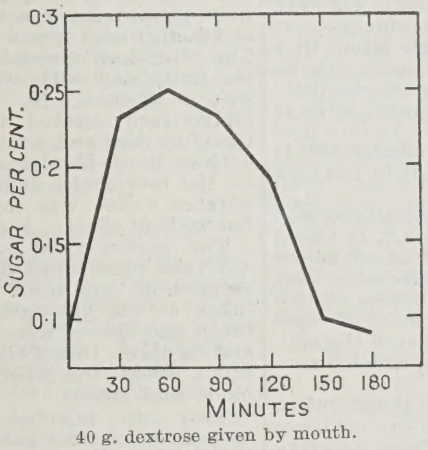
CASE 11.—A married woman, aged 30, sought advice for vulvitis, and wore a ring for prolapse of the uterus. Her medical adviser found sugar in the urine. I have seen close upon a hundred cases of orthoglycæmic glycosuria; none of these has had balanitis, and only two vulvitis. A glycosuria accompanied by balanitis or vulvitis will very probably prove to be diabetes mellitus. The patient was submitted to the usual sugar-tolerance test on July 26th, 1929; the concentration of sugar in the blood rose to 0·30 per cent., and had fallen to 0·15 per cent. after two hours. The patient expressed a desire to go abroad in six months' time, and I therefore advised investigation. She was placed upon a modified diet for a time, but was given more than 120 g. of carbohydrate in her diet during the four days previous to August 20th, when she was submitted to a second tolerance test. It will be seen that on that occasion the curve was that of the average normal (Fig. 11). She was then given a diet containing 150 g. of carbohydrate, a considerable fraction of which was cane-sugar; she did not develop hyperglycæmia. Another tolerance test on August 26th showed that the curves obtained were too variable to justify a diagnosis. The patient was quite willing to be vaccinated against typhoid and paratyphoid and I made observations on the effect of these bacterial toxins upon the concentration of sugar in the blood. After the injection of the vaccine the sugar in the blood was found to be low. This case is recorded in order to show how inadequate are our methods for diagnosing diabetes mellitus.

FIG. 7.



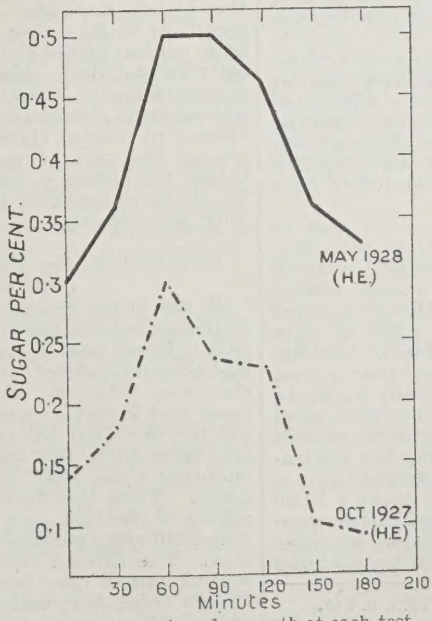
50 g. dextrose given by mouth.

FIG. 8.



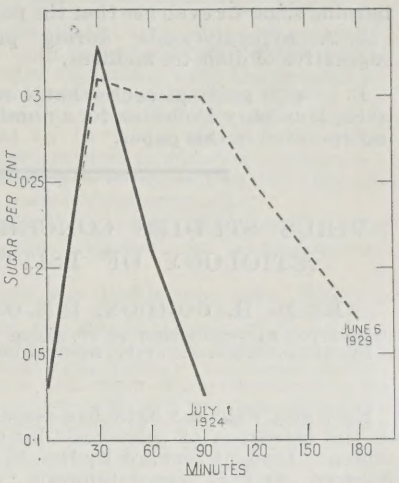
40 g. dextrose given by mouth.

FIG. 9.



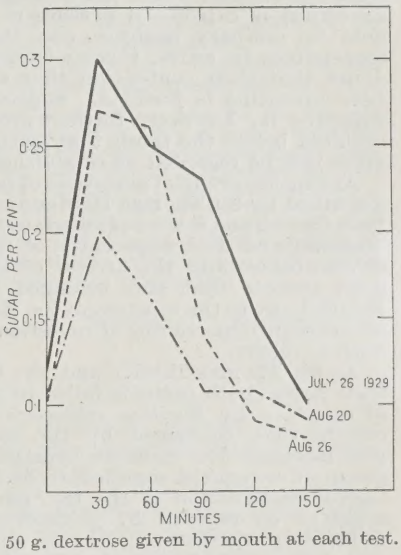
60 g. dextrose given by mouth at each test.

FIG. 10.



50 g. dextrose given by mouth at each test.

FIG. 11.



50 g. dextrose given by mouth at each test.

Summary.

1. Hyperglycæmic glycosuria is not necessarily diabetes mellitus.
2. The diagnosis of diabetes mellitus in a patient free from symptoms should be based either upon

a very considerable loss in the power of storing and/or burning sugar or evidence that the power is decreasing.

3. A hyperglycæmia during protein shock is suggestive of diabetes mellitus.

It is with great pleasure that I record my thanks to Sir Humphry Rolleston for a number of suggestions incorporated in this paper.

VIRUS STUDIES CONCERNING THE ÆTIOLOGY OF PSITTACOSIS.

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NEW and welcome light has recently been thrown on the causation of psittacosis by the experimental evidence brought forward by Drs. S. P. Bedson, G. T. Western, and S. Levy Simpson [1] of the London Hospital, to the effect that the budgerigar can be fatally infected either by suspensions of organs of parrots or by blood taken from patients suffering from this disease. Since the pathogenic principle here concerned is capable of passing through filters that hold up ordinary bacteria, and the disease can be transmitted in series, there would seem to be little doubt that their contention that a filtrable virus is here operating is justified. Suggestive as this new evidence is, however, further proof admittedly is required before the thesis that psittacosis is due to a virus can be regarded as established.

Among the group of nine cases of psittacosis recently described by Sir Thomas Horder and Dr. A. E. Gow [2] two, Cases 3 and 9, were admitted to St. Bartholomew's Hospital and died apparently of the disease. That circumstance, and the arrival of the bodies of two dead parrots that had belonged to the last case (which I owe to the courtesy of the Ministry of Health), afforded an opportunity of investigation which I now wish to report.

As Sir Thomas Horder and Dr. Gow point out in their paper, both patients failed to give any evidence of infection by *Bacillus psittacosis*. These negative results were confirmed by the examination made post mortem. Nor could any organisms of the enteric group of recognised significance be found. Bacteriological examination of the two parrots was equally negative as regards *B. psittacosis* or non-lactose-fermenting organisms.

Search was next made for the presence of a virus, the materials being injected into budgerigars as recommended by Bedson and his colleagues. Chaffinches were also tried in some of the experiments, but were found to be refractory. In the majority of the tests mice were also used, a pair being injected at the same time with the same doses and then kept in the same stable.

Procedure in preparing the suspensions was as follows. A bacteriological examination was first made of the various organs and when seriously infected with bacteria such as cocci, these tissues were placed in 50 per cent. glycerin in the refrigerator for a week, or else a suspension was made at once and passed through a Seitz filter. If free of bacteria the tissues were used direct as it was felt that a good portion of any virus that might be present would be likely to be held up by the filter, and it was desired to give any pathogenic agent that might be present as good a chance as possible. In making the suspensions a weighed amount of tissue was ground up in a mortar with distilled water sufficient to make a 1 : 20 suspension, and if filtering was employed this suspension was diluted first to 1 : 50 because stronger suspensions than that of freshly ground up material were apt to clog the filter even when first passed through filter paper. Uniformly the filtrates were found to be sterile. The injections were made intramuscularly into the birds, and both subcutaneously and intraperitoneally into mice, care being taken to give not over 0·5 c.cm. by the latter route. The usual dose was 1·0 c.cm. The results have been as follows.

Infection from Human Cases.

Case 3 of Horder and Gow. At the autopsy on Feb. 3rd the spleen was removed, and after a portion of its surface had been seared with a hot iron a piece of the underlying tissue was cut out, suspended in water, and injected into two budgerigars and two mice. One of the birds got ill between the fifth and seventh day, but later recovered. The other died in 21 days and no bacteria could be found in its blood or organs. The mice were unaffected (21 days).

A third budgerigar was inoculated with the filtrate of this suspension of the patient's spleen. It died on the tenth day with sterile organs. A mouse inoculated with a suspension of the spleen and liver of this bird died in 11 days with sterile organs, and a suspension of its spleen in turn killed a further mouse in 17 days again with sterile organs.

Pieces of the lung and brain (pons) of this case were preserved for a week in 50 per cent. glycerin and then ground up and injected into two budgerigars. The bird that received the lung suspension died on the tenth day with sterile organs. The other bird was unaffected. No less than three of the five budgerigars injected with material from this case therefore died and a fourth got ill and recovered.

Case 9 of Horder and Gow. Blood (one part) on the fourteenth day of the disease in four parts citrated saline was injected into two budgerigars, but without effect. It also had no effect on four mice.

The post-mortem examination on Feb. 14th did not take place until 36 hours after death. Spleen suspension, unfiltered and filtered, and secretion taken at the bifurcation of the trachea diluted in broth and filtered were injected into two budgerigars and six mice. One of these budgerigars was unaffected in six weeks, the other died in 38 days with sterile blood and spleen.

Two mice injected with the unfiltered spleen suspension of this patient both died on the thirty-third day with sterile organs. Another pair that received the filtrate of the same material both became ill on the twenty-second day; one died the next day, the other survived till the forty-second day. One of two mice that received the filtered bronchial secretion of this case was dead on the fourth day and contaminated; the other survived till the forty-second day. None of these five mice showed any evidence of a bacterial infection. Nevertheless, passage was successful to further mice by using the spleens of four of them; but in each instance only one of the pair of mice inoculated died, the time taken to produce death being from 10–19 days. In all cases cultures from the spleens of the dead mice were negative.

Properties of the Virus Strains as Revealed by Experiments on Mice.

As the mouse is susceptible, an attempt was made to obtain information by employing that animal, the spleen being used for transference after its sterility had been proved by culture. Passage experiments in this way with the virus derived from the human cases and from the parrots respectively soon brought out the fact that the pathogenicity for the mouse of the virus from the birds was far more active and enduring than that of the virus from the human cases. Thus the virus obtained from the filtered spleen of the first case via the budgerigar came to a standstill after passage through three mice in succession. The filtered suspension of the organs of the second human case caused death in a mouse on the twenty-third day, and the spleen suspension of that animal killed one of two mice injected with it in ten

[1] THE LANCET, Feb. 1st, p. 235, and Feb. 15th, p. 345.
[2] Ibid., March 1st, p. 442.

days. Two further mice now died in six and ten days, but after another passage the virus lost its potency, and further attempts to obtain a passage virus from mice that succumbed to injection with the organs of this patient or with filtrates therefrom did not succeed for more than one or at the most two generations.

A very different result was obtained with the virus derived from the parrots. In the case of *Parrot I* (which died at No. 9 patient's residence on Feb. 6th), two strains of the virus have been under study. Of these strain A was derived directly from the unfiltered spleen suspension of the parrot. The primary mice both died on the sixth day, the second pair in five days, the next pair in four days, and subsequent pairs have nearly all died in three days. Similar results were given by strain B derived from the filtrate of the same parrot's spleen, where the first mouse died on the tenth day, and subsequent mice in six, four, three, and two days in succession. Both these strains are still as active as ever, A being at its fifteenth passage and B at its tenth.

In the case of *Parrot II* (which came from the same house and died on Feb. 7th), although the primary mice did not die until after 18–24 days, the filtrate of the pooled spleen suspension of the two latter mice killed in nine days, and death in subsequent passages occurred in six days, three days, and two days successively. This virus is also showing no evidence of deterioration, and is now at its eighth passage.

Attention accordingly has been concentrated on the parrot virus, and the following observations were made on mice with strain A of Parrot I.

Characters of the Virus Obtained from Parrot I.

1. *Pathogenicity for the Budgerigar.*—The virus derived from the spleen of Parrot I after passage through two mice in succession was filtered, and the filtrate divided into two parts. One of these portions was heated to 55° C. for 30 minutes. A budgerigar and two mice were then injected severally with 1 c.cm. of each portion with the following result.

Unheated Filtrate: The budgerigar died on the twenty-eighth day; one mouse died on the sixteenth day, the other on the nineteenth.

Heated Filtrate: The budgerigar and one mouse were still unaffected two months after injection; the other mouse died on the twenty-fourth day.

Two mice injected with the spleen suspension of the first budgerigar died in seven and nine days respectively, and in two further passages the mice died in 4–6 days and in 2–4 days successively. By passage, therefore, the parrot virus rapidly increased in virulence for the mouse after recovery from the budgerigar.

2. *Effect of Filtering.*—While this parrot virus is certainly capable of passing through the Seitz filter, comparison of the action on mice of the same suspension of virus before and after filtering has repeatedly shown that the unfiltered virus kills as a rule far more surely and quickly than the filtrate.

Thus in an early experiment the unfiltered virus killed both mice in five days, the filtrate took seven days; after passage, the unfiltered virus took four days, the filtrate nine to ten days, and after further passage the unfiltered virus killed both mice in three days, while the filtrate took no less than 14 days to produce death.

The probable explanation is that the filter retains a proportion of the virus. A parallel experiment with vaccinia virus showed that apparently all of it was retained by the Seitz filter, since a suspension of that virus active to a dilution of 0·00001 c.cm. before filtering became inert. Even when 2 c.cm. of the filtrate was injected into a rabbit's testis no lesion and no immunity resulted.

3. *Effect of Heat.*—The experiments on mice have indicated that while exposure for 30 minutes to 55° C. attenuates the virus, it does not always destroy all of it. On several occasions a proportion of the mice injected with the heated virus have died generally considerably later than those receiving the raw virus. Passage was recently successful with the spleens of two of these mice that had succumbed late to the heated virus. Vaccinia virus behaves in a similar way when exposed to 55° C. for 30 minutes. The effect of higher temperatures is under investigation; exposure for 30 minutes to 80° C. and 100° C. appears to inactivate the parrot virus completely.

4. *Effect of Desiccation and of Disinfectants.*—The following result was obtained in a preliminary experiment.

Virus control: both mice dead in three days. The same virus after being dried in vacuo and then resuspended; one mouse died in six, the other in 11 days. The same virus after exposure for 30 minutes to 1:10,000 potassium permanganate at room temperature; one mouse died in four days, the other in five. Some of the virus received the addition of 0·5 per cent. carbolic, and was then exposed for 20 hours at 37° C.—a treatment that kills non-spore-bearing bacteria. The single mouse here injected died on the thirteenth day, thus confirming a result referred to in a preceding paragraph. The same virus that was used for these tests was also exposed for 30 minutes to 55° C. One mouse died in 13 days, the other was unaffected a month later when discarded.

It would seem from these results with mice that the parrot virus offers considerable resistance to desiccation and to certain disinfectants.

The effect of adding ether to a suspension of the virus was tried in the following experiment.

The pooled spleens of the mice used for the seventh passage of the virus were ground up in 12 c.cm. of distilled water, and this was divided into two equal parts. One-tenth part of ether was then added to one portion, and both were then well shaken and placed in the cold store for a week. At the end of that time each portion was taken out, shaken up, and after standing for five minutes dilutions were made from each and tested on mice. The dose throughout was 1 c.cm. and the results were as below. (The figures refer to the days that the mice took to die.)

Spleen dilution.	No ether.	Etherised.
1:100	4, 4	6, 9
1:1,000	5, 6	7, 9
1:10,000	5, 9	8, 25

The ether therefore weakened, but did not destroy the virus. Passage was successful from the mouse that survived for 25 days.

5. *Distribution of Virus in Mice that Succumbed.*—The pooled spleens of the two mice used for the fourth passage of the virus were tested on mice in a dilution of 1:100, 1:1,000, and 1:10,000 respectively, and the first pair died in three days, the other two pairs in seven days. The blood and spleen of each of the last pair were then suspended in distilled water, and a series of dilutions made and tested on mice. The results are shown below; as before, the figures refer to the number of days that the mice took to die.

		Dilutions.			
Mouse.	Tissue.	1:100.	1:1000.	1:10,000.	1:100,000.
59	Blood	6	7	8	S.
59	Spleen	6	13	7	9
60	Blood	S.	10	8	S.
60	Spleen	4	4	6	7

S. = Survived.

It would seem that the virus was more abundant in the spleens of both mice than in their blood.

Action on the Rabbit of Parrot Virus After Mouse Passage.

1. *Cutaneous Experiments.*—By employing an aqueous suspension of the spleen of a passage mouse both strains of virus from Parrot I, and also that from Parrot II, were tested on the shaved skin of the rabbit.

Falling dilutions were made as in the last experiment, and 0·2 c.cm. of each was then injected intracutaneously. It

was found that all three strains produced a raised papular swelling that became bright red in from 40–60 hours, lasted for two or three days, and then faded. The colour of this eruption varies from a faint rose pink to a bright scarlet according to the activity of the strain and also to the particular rabbit. Pale areas appear in some of the papules, but so far no certain vesicles have been seen. The diameter of the papules varies from over a centimetre to a few millimetres according to the dose of virus injected. The local lymphatic glands are swollen and may also be deeply congested. When scarification was tried and the virus applied to the surface of the skin a crop of papules followed, but the result was less definite and striking than when the intracutaneous route was used.

Advantage was taken of this action of the parrot virus on the rabbit's skin to examine once more the effect of passing the virus through a Seitz filter, and also of heat, &c. From present results it would seem that the pathogenicity of the virus for the rabbit's skin is far more easily inactivated by these measures than is its lethal effect on mice, as indicated by experiments in a preceding section; for a 1 per cent. suspension of mouse's spleen containing virus active on the rabbit's skin up to a dilution of 1 : 10,000 gave no result at all, either after being filtered, or after being heated for 30 minutes to 55° C. A comparable test carried out with vaccinia virus gave a broadly similar result.

The papular eruption produced by the parrot virus when injected intracutaneously into the rabbit bears a close resemblance to that excited under similar circumstances by certain strains of herpes virus of human origin.

2. *Action on the Rabbit's Central Nervous System.*—In case of each of the three strains of parrot virus suspensions of the spleens of passage mice in distilled water were injected intracerebrally into rabbits in a dose of from 0·1 to 0·2 c.cm. followed by 1 c.cm. of the same material intravenously. Further particulars and the results were as follows.

Parrot I, strain A, eighth passage mice spleens pooled, 1 : 100. The rabbit died in 48 hours. Parrot I, strain B, sixth passage mice spleens pooled, 1 : 100. The rabbit became paralysed on the third day and died the same day with convulsions. Parrot II, fourth passage mouse's spleen, 1 : 50. The rabbit became ill on the fourth day; it developed some head retraction on the seventh day and died on the eleventh. After death the meninges in two of these rabbits showed some congestion, but no other naked-eye changes were observed. The meningeal secretion and the heart's blood of all three showed no bacteria either in films or cultures. A repeat experiment was carried out with Parrot I, virus strain A, in order to see the effect of passing the virus through a Seitz filter and of heating the filtrate for 30 minutes to 55° C. The rabbit that received the unfiltered and unheated virus became paralysed on the fourth day and died on the fourteenth with sterile blood and meningeal exudate. The rabbit that received the unheated filtrate went off its feed for a few days, but developed no obvious paralysis and recovered. The third rabbit was unaffected. Both the last two rabbits are alive and appear to be quite normal at the present time—over six weeks since injection.

Sections have been examined of the central nervous system of the rabbits that succumbed to the parrot virus. All of them show evidence of meningitis, the exudate being chiefly composed of lymphocytes, and the meninges slightly thickened at places. In the case of two of these rabbits there is also some evidence of encephalitis—e.g., besides a pronounced degeneration of the nerve-cells occasional cuffing of the vessels in the white matter, and very rarely a few small inflammatory foci.

In the case of two of the rabbits that succumbed to intracerebral inoculation of the parrot virus a preliminary attempt was made to ascertain the distribution of the virus by titrating dilutions of the blood and organs on a rabbit's skin, and in the case of the first rabbit this was supplemented by inoculating mice with dilutions of 1 : 1000 and 1 : 10,000 of the blood, urine, spleen, brain, and nasal mucous membrane. The results given on the rabbit's skin indicated that the virus was more active and abundant in the spleen and nasal mucous membrane than elsewhere, and mice that received the 1 : 10,000 dilution of both these materials succumbed with sterile spleens from which the virus was successfully passaged to further mice. These observations, however, afford merely an indication, and require to be confirmed and considerably extended before an adequate picture can be obtained of the distribution of virus in rabbits that succumb to its action.

The above experiments refer to the parrot virus alone. An attempt was made to infect a rabbit intracerebrally with the virus obtained from the spleen of Case 9 of Horder and Gow by using a suspension of the spleen of the second passage mouse, but the result was unsuccessful. This same virus also produced only a slight colourless swelling when injected into the rabbit's skin.

Control Observations on Normal Birds of the Parrot Tribe.

Through the courtesy of Colonel A. E. Hamerton, pathologist to the Zoological Society of London, and of Mr. Seth Smith, superintendent of the Society's Gardens, it has been possible to make some control observations on normal birds of the parrot tribe killed accidentally. The spleens of these birds were taken out by Colonel Hamerton in course of his routine post-mortem examination, and kindly forwarded to me. On arrival these spleens were ground up in distilled water in the same way as the spleens of the parrots associated with Case 9 of Horder and Gow and injected into mice.

The birds examined in this way consisted of a normal example of the Amazon parrot *Amazona aestiva*, the kind that has been especially under suspicion in regard to psittacosis. The spleens have also been examined in the same way of a blue and yellow macaw, a rose-crested cockatoo, a Tovi parakeet, and four normal budgerigars. The mice, of which six were used for the first bird—the Amazon parrot—and two for each of the others, were kept under observation for a month. When a mouse died cultures were made from its spleen, and, if negative, passage was tried to further mice.

The result of this investigation was as follows. Of the eight birds examined six gave negative results. In the case of one of the budgerigars, however, one of the two primary mice injected with the spleen suspension died on the sixteenth day with a sterile spleen. Passage was successful to a pair of mice that succumbed on the tenth day and from them to a further mouse that died on the fifth day. This virus produced a moderately typical eruption on the skin of a rabbit, but it seems to have become attenuated latterly since the more recent mice have successfully resisted its action.

The other positive case was that of the blue and yellow macaw that was not quite a normal bird, as it had (as Colonel Hamerton pointed out) a mycotic deposit in one of its air sacs. One of the pair of mice inoculated with the spleen suspension of this bird died on the nineteenth day with sterile spleen. Both of a pair of mice to which transference was made died in four days, and from them passage has been successful through seven generations. The virus at present shows no signs of deterioration, but appears to be increasing in virulence for mice. This macaw virus when injected intracutaneously into the rabbit produces a bright red papular eruption indistinguishable from that excited by the virus strains from the two parrots associated with Case 9 of Horder and Gow. A rabbit injected intracerebrally with the macaw virus became paralysed in its front legs on the third day and remained in this condition for ten days, after which convalescence set in, and it is now able to move its front paws quite well and is gaining in weight.

Intracerebral Inoculation of Mice.

The neurotropic capacity of the parrot virus revealed by the rabbit experiments appeared to afford a possible explanation of the mode of death of certain passage mice that developed a form of general motor paralysis towards the end. Observations are now in progress in which the effect is being determined of the parrot virus when inoculated by the intracerebral route.

In an experiment with strain A, of Parrot I, during its fifteenth passage, one mouse received the usual dose of

1 c.cm. of the virus in the routine way by the peritoneal and subcutaneous routes, and another received one-tenth of that dose intracerebrally. Both mice were dead by the third day, and the abundance of virus in the brain and spleen of each was determined by preparing dilutions of each organ from 1 : 100 to 1 : 10,000, and injecting 0·2 c.cm. of each into the skin of a rabbit. The result showed that both spleens contained the virus up to the 1 : 10,000 dilution, and that the brain of the mouse injected by the usual routes gave a negative result with the 1 : 100 dilution, whereas that of the other gave a positive result up to a dilution of 1 : 1000. In a parallel experiment with strain B from the same parrot, a mouse that received the virus by the usual routes died on the seventh day, and another that received one-tenth of the dose intracerebrally developed on the same day a complete flaccid motor paralysis limited to its hind quarters, and died the following day.

Comments.

Confirmation, therefore, has been obtained of the presence of filtrable virus in two cases of psittacosis, and in two parrots associated with the second case.

The outstanding feature of the experiments reported in this paper is the manner in which the strains of virus obtained from the parrots associated with the second case of psittacosis have maintained and increased their virulence by passage through mice. The dermotropic and neurotropic affinities displayed by this virus after mouse passage for rabbits suggest that it may belong to the same group as the herpes virus. The relation between that virus so frequently carried by human beings, and the present one derived from parrot forms one of the problems calling for investigation.

The virus derived from the human cases has not so far displayed the same degree of pathogenic stability for mice as that derived from the parrots. Experiments are at present in progress in which strains of herpes of human origin are being passaged through mice, and the first of these strains has come to a standstill after passing through three mice in succession. Further experiments on this question are required, and also observations in which blood and material from human beings suffering from various febrile conditions are investigated in the same way. The mouse may prove to be a more valuable means for the isolation and study of viruses than has hitherto been realised.

AN EXPERIENCE WITH AVERTIN ANÆSTHESIA IN GYNÆCOLOGY.*

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The efforts continually being made to improve our anæsthetic drugs testify to a general sense of dissatisfaction with the present methods of surgical anæsthesia. It must be a matter of common opinion that the fact that such drugs as chloroform and ether are still in common use for complete anæsthesia is eloquent testimony to the poverty of our present resources. The saturation of every tissue with such irritant and toxic materials, as the only available method of bringing under control the specialised sensory apparatus of the body, is so crude and so unscientific as to carry with it its own condemnation, and to deserve no greater sanction than that implied in the exigencies of the early and necessary developmental phases of every art. The discomfort and even dread that their employment often provokes, the damage to the vital organs, and the common post-operative sickness and pulmonary complications which they are apt to induce, add much to the torture of the patient and to the anxiety of the operator.

Any method of general anæsthesia which professes to provide safety of induction, whilst eliminating much of the accessory danger and discomfort, is worthy of most serious attention. An experience with avertin, though still limited and experimental, has encouraged me in the belief that with this drug we may possess such an improved method of administration.

Avertin was introduced to British surgery in 1929, first by Morrin,[1] of Dublin, and, later, by Blomfield and Shipway,[2] of London. The latter workers carried out a test with the drugs at the instance of a conjoint committee set up by the Medical Research Council and the Section of Anæsthetics of the Royal Society of Medicine. All these anæsthetists speak of its potency and its potential dangers, but at the same time they express their belief that it is "a valuable addition to the drugs at the disposal of the anæsthetist, and that if used with due care and moderation its advantages can be taken advantage of with perfect safety."[2]

Method of Administration.

The method which I employ follows closely that laid down by the manufacturers and the anæsthetists above mentioned. On the evening before the operation the bowel is washed out with an enema. No subsequent enema is given on the morning of the operation, as any fluid retained may interfere with the dilution of the anæsthetic solution. One hour before the operation one-eighth of a grain of a morphine salt is given hypodermically. In the earlier cases a quarter of a grain of morphine was used and respiratory depression was sometimes marked, in one case causing anxiety. Since halving the dosage the respiratory depression has been less pronounced, and in no instance has there been reason for worry. Some observers state that they have with advantage discarded the preliminary sedative entirely.

The avertin is supplied as a liquid in which the drug is held in solution by amylene hydrate; each cubic centimetre of the fluid contains 1 g. of avertin. The amount to be given is accurately proportioned to the body-weight, the safest maximum ratio according to common finding being 0·08 to 0·1 g. per kg. of the patient's weight, the smaller dosage being employed for weakly individuals. The makers supply a detailed chart by which the quantities can be easily and rapidly determined. The drug, measured out freshly for each patient, is added to distilled water heated to 40° C. and shaken to make a solution of 2½ to 3 per cent. The temperature must not be raised beyond this, otherwise there is the risk of hydrobromic acid being produced; this is irritating to the bowel. To exclude the presence of this material one or two drops of a 1 in 1000 solution of Congo-red are added to 5 c.cm. of the avertin solution. When the impurity is present the colour turns blue. I may add that on no occasion have we ever found it necessary to discard the solution as prepared for use on account of the presence of this impurity.

The anæsthetic is administered before the patient is removed from bed. It is introduced slowly into the rectum half or three-quarters of an hour before the operation by means of a soft tube passed in about four inches. The patient lies on the side to prevent sagging of the jaw and tongue. It is advisable for the anæsthetist to be present or immediately available throughout the administration, although in general we have found it both safe and expedient to leave the actual administration itself to a nurse who has experience in the procedure.

Amongst the strongest commendations of the drug are the ease, comfort, rapidity, and certainty of the anæsthesia. The psychical strain and unpleasantness inseparable from inhalation methods are absent. In the certainty and rapidity of its action it is superior to the rectal ether method. Consciousness is often lost in a few minutes. The maximum anæsthesia is attained in about half an hour, and for this reason the operation should not be commenced before at least this interval has elapsed. In about 25 per cent. of

* A paper read before the Edinburgh Medico-Chirurgical Society on March 5th.

the cases the anæsthesia is sufficiently profound for a minor and in a smaller proportion for a major operation. Ordinarily the anæsthesia requires to be supplemented by the inhalation of ether or gas and oxygen. My practice is to employ ether, as this has a stimulating action on the blood pressure which in some cases shows a marked tendency to fall with avertin. The amount of supplemental ether required varies in individual cases and according to the type of operation. It is usually much less than that required for ordinary inhalation anæsthesia, and even for a lengthy operation no more than one ounce may be necessary. It is interesting that avertin tends to obliterate the corneal reflex, while leaving the pain and other sensations active, so that a patient who appears sufficiently deep in anæsthesia may respond to the irritation of the towel clips.

The anæsthesia of avertin has been aptly likened to the unconsciousness of deep sleep. It usually lasts for about two hours and may last much longer, the patient wakening naturally, though usually the sensations remain dulled well into the evening. There is usually no post-operative nausea or sickness. At the most this rarely troubles the patient more than once or twice, and quickly subsides.

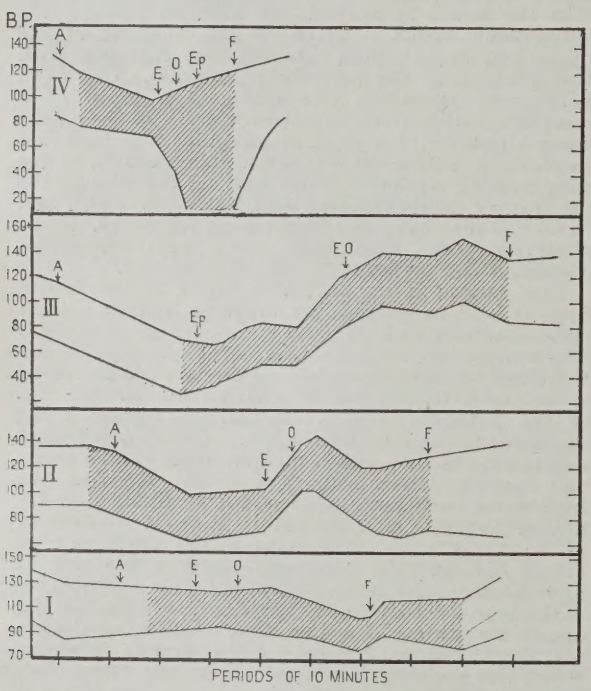

Chart showing blood pressure during operations conducted under avertin anæsthesia. A = completion of administration of avertin; E = start of administration of ether; O = commencement of operation; Ep = injection of 0·5 c.cm. ephedrine hydrochloride; F = end of operation, patient removed to bed. The upper line of each graph represents the systolic pressure, the lower the diastolic. The actual readings are given along the ordinates; the divisions on the abscissa are intervals of 10 minutes. The shaded portion represents the period during which the patient was under constant observation, while the unshaded portion to the left gives the pressure half to one hour before avertin administration, and that to the right the pressure about 10 o'clock next morning. The time relations of the unshaded portions are therefore not exact.

Notes on Cases.—CASE 1. Mrs. H., aged 38. Wt. 9 st. 6 lb. 5·9 c.cm. avertin, 4 oz. ether. Pelvic floor repair. No ephedrine given. CASE 2. Mrs. R., aged 42. Wt. 6 st. 3 lb. 3·9 c.cm. avertin, 3 oz. ether. Supravaginal hysterectomy. No ephedrine. CASE 3. Mrs. M., aged 45. Wt. 9 st. 13 lb. 6·1 c.cm. avertin, 2¾ oz. ether. Pelvic floor repair. Half an hour after the exhibition of the avertin the systolic pressure had fallen 54 mm. and ½ c.cm. ephedrine was administered. CASE 4. Mrs. M., aged 39. Wt. 6 st. 1 lb. 3·8 c.cm. avertin, 1 oz. ether. Dilatation and curettage. The peculiar drop of the diastolic curve to the abscissa indicates that there was no cessation of sounds heard over the brachial artery, nor any qualitative change from a "third" to a "fourth" sound. A loud bruit was heard without any compression on the limb. This disappeared soon after the patient was returned to bed, and she did not show any signs of distress.

The dominating advantage of the drug is its lack of toxicity. It has apparently no damaging effect on the heart or liver. It has a depressing action on the respiration, which becomes slower, sometimes with stertor. Overdosage, it would seem, tends to paralyse the respiratory centre and several such cases have been recorded. I have had one case of marked cyanosis and a tendency to respiratory failure in a woman who was left unattended for some minutes after the administration. The condition may have been due to a mechanical blocking of the upper tract with the tongue, a risk especially to be looked for during the anæsthesia. In this instance the administration of carbonic acid gas quickly rallied the patient.

The Influence of Avertin on Blood Pressure.

In many instances avertin causes a lowering of the blood pressure. In our experience this has been more frequent and at times more pronounced than that appearing in the descriptions either in the manufacturers' brochure or the records of the other British investigators. Blomfield, for example, states that a drop of 10 to 15 mm. is to be expected, whilst Shipway records that in his experience the fall was about 15 mm., the maximum being 30 mm. Hg. The makers' brochure refers to the average fall as 20 to 40 mm. Hg. In my cases there has been a range of variation from nil to as much as 100 mm. Hg. In women with normal pressure I have on several occasions found a drop from 150 or 140 systolic to well under 100, and on one occasion there was a drop of the systolic pressure from 190 to 90, and in another from 180 to 90. These experiences are represented on the graphs (Figs. 1 to 4) prepared by Dr. W. P. Kennedy, of the Physiology Department of Edinburgh University, and may be dependent upon the fact that operative interference with the female genitalia has a special tendency to lower the systemic blood pressure. On this question further research is clearly required. In all of these cases the recovery of the pressure was satisfactory after the hypodermic administration of pitressin or ephedrine. In only one instance was the drop in pressure associated with any other alarming phenomena, and we are coming to regard the fall in blood pressure with increasing equanimity. The pulse tends to vary directly with the systolic pressure.

Analysis of Results.

I have used avertin in a total of 345 unselected hospital and private cases. There were 70 operations involving opening the abdomen, including hysterectomy 25 times, ovariotomy 6, salpingo-oöphorectomy 7, and appendicectomy 8 times. There were 48 operations for vaginal prolapse, and 2 for excision of the vulva for carcinoma. The remainder of the operations were, for the most part, minor operative procedures—e.g., dilatation and cauterisation of the cervix (57), curettage for exploratory purposes (29), radium insertion in cervical cancer (33), emptying the uterus in cases of abortion (6), and plastic operation for vesico-vaginal fistula (2).

There were two deaths, a mortality of 0·6 per cent. Our previous hospital mortality in 1799 successive cases, with ether alone or in combination with chloroform as the routine anæsthetic, was 34—that is, 1·9 per cent. The report of the Royal Samaritan Hospital for Women, Glasgow, for 1928 shows a mortality of 31 in 1836 gynæcological operations or 1·7 per cent. The details of the two fatal cases are as follows:—

CASE 1.—A para-8, aged 52, had a history of downbearing for 20 years, and of a protrusion from the vulva for five years. Retention of urine necessitating catheterisation had been present. There had been intermittent bleeding since the menopause five years previously. Suddenly, on August 29th, 1929, a large mass prolapsed from the vulvar opening, extending down as far as the knees. On admission the pulse-rate was 116. The tumour mass consisted of a markedly infected and sloughing fibroid tumour about the size of a fœtal head and, at the upper end, of an enlarged and inverted uterus and prolapsed vagina. On August 30th

the general condition was considered to be fairly satisfactory, and the fibroid was removed and the uterus reinvaginated from below. With the object of removing the damaged and infected uterus, supravaginal hysterectomy was carried out. The blood pressure was not recorded until the end of the operation at 11.30 A.M., when the patient was collapsed, and the pressure was 60/40 mm. Hg. Submammary saline and intravenous gum saline were administered while she was in the operating room. In spite of the usual cardiac stimulants and pitressin, she sank rapidly and died at 11 P.M.

CASE 2.—A para-4, aged 40, had a history of an abdominal swelling for one year, whilst for ten days there had been vomiting, acute pain in the right iliac fossa, and fever. At the operation on Oct. 2nd, 1929, the omentum and bowel were found to be densely adherent over a mass occupying the lower abdomen and pelvis, and during separation pus escaped. The anatomical outlines were obscure, the surmise being that we were dealing with an infected ovarian cyst. The mass was removed with difficulty, and the remaining cavity was packed with gauze. At the end of the operation the pulse-rate was 96, and the general condition was very satisfactory. During the day the pulse-rate rose steadily, and by evening was 160. She collapsed and died next day at 3 P.M., about 28 hours after the operation.

In neither case was an autopsy obtainable but we may, I think, conclude that in neither was the avertin the determining cause of the fatal issue. Neither showed the deepening coma and respiratory involvement that accompany the known toxic actions of the drug. In each case we were dealing with patients presenting a grave operative risk and in both we are faced with the futility of attempting after the event to determine how far a different method of treatment might have led to a more favourable conclusion. In each case, as it so happens, it would be as possible to argue in favour of some surgical procedure other than that actually selected as it would be to argue that different anæsthesia, for example gas and oxygen, might have improved the prognosis. My own conclusions, after a careful study of both cases, is that the avertin in neither can be definitely incriminated. The first case, however, raises the question of the appropriateness of this drug in a patient suffering from severe pre-operative shock.

Both cases belong to our early series and our subsequent experience, embracing as it has done a considerable number of similarly poor operative risks, with the discovery that a falling pressure can be controlled by ephedrine, has increasingly tended to the conviction that in eliminating the toxicity and the pulmonary complications attendant on ordinary inhalation anæsthesia we can now embark on severe operative procedures with an added confidence. In these respects my views coincide with those of others who have used avertin.

Reduction of Post-operative Sickness and its Risks.

Throughout there has been practically a complete absence of post-operative nausea and sickness, even in those cases in which as much as 8 to 10 ounces of ether has had to be administered during a lengthy operation. This seems to be explained by the narcosis, which is prolonged for some hours after the operation, allowing the elimination of the ether to occur whilst the centres are still in a dulled state. In no instance have there been such gastro-intestinal complications as acute dilatation of the stomach or paralytic ileus. This relative absence of post-operative sickness is one of the most important advantages of avertin, an advantage which it shares with spinal anæsthesia. It adds much to the patient's comfort during the early post-operative period and it is a fact of supreme importance in operations in the abdomen and on the pelvic floor, where trauma of the wounds due to straining may have serious effects. We have been especially impressed with the advantages of avertin in plastic operations on the pelvic floor, which constitute a relatively large proportion of our cases. It is known that these operations for prolapse are not devoid of risk, the special danger being hæmorrhage and sepsis. It may safely be presumed that the retching consequent on inhalation anæsthesia, by leading to a straining of stitches placed in wounds which often imply deep dissection in vascular areas, is an important cause of trauma and post-operative hæmorrhage and of the sepsis that may result. Further, an associated infection predisposes to the risk of tetanus, of which we have recently had some tragic examples in Edinburgh after pelvic repair operations for prolapse. I discarded ordinary inhalation anæsthesia some years ago in such operations in favour of spinal anæsthesia with stovaine. Latterly, with the advent of avertin, I have used this drug with the minimal amount of ether it requires. This combination is superior to spinal anæsthesia in that it eliminates both the pain and distress of the actual administration and the paresis of the bladder with the prolonged need for catheterisation that may follow on the latter method. I still retain spinal anæsthesia, however, as the routine procedure in Cæsarean section, because of the specific outstanding advantages it possesses of diminishing the bleeding from the uterine wound. This kind of natural hæmostasis seems to depend upon the removal of the inhibitory control of the central nervous system, allowing the sympathetic to exert its constrictor action on the muscle and vessels of the uterus. With its use Cæsarean section becomes a relatively bloodless operation; shock, a factor of supreme moment in many cases, is diminished; whilst the discarding of inhalation anæsthesia reduces the most potent danger in this operation—a danger especially great where sepsis is already present—namely, post-operative bronchitis and bronchopneumonia. During an experience of over four years with spinal anæsthesia in Cæsarean section I have had complete immunity from these pulmonary complications, and this result is especially significant in view of the fact that in a considerable number the operation was carried out in emergency and, therefore, potentially infected cases.

Altogether I have carried out 143 repair operations for vaginal prolapse with spinal anæsthesia, and 48 with avertin and ether—that is, a total of 191 cases without a death, and practically without pulmonary trouble, local hæmorrhage, or sepsis. There are few records showing the mortality risks of prolapse operations with other anæsthetics. Our own previous figures of 340 cases, with ether alone or combined with chloroform as the routine anæsthetic, show a mortality of 6, or 1·7 per cent. In three instances the cause of death was sepsis, in one tetanus, in one bronchitis, and in one heart failure. The Samaritan Hospital of Glasgow shows a total of 326 prolapse operations with six deaths—that is, a mortality of 1·8 per cent. during 1928. In two instances the deaths were caused by pneumonia, and in one each by acute dilatation of the stomach, septicæmia, pulmonary embolism, and hæmorrhage.

In a further effort to reduce the post-operative risks, I have for some time been carrying out additional precautionary measures. To reduce the risk of gastro-intestinal complications and of inhalation of septic matter into the lungs, an effort is made in every case to eliminate obvious focal sepsis in the teeth and tonsils and, in the case of pelvic repair operations, every patient receives a preliminary preventive inoculation of a stock streptococcus and *Bacillus coli* vaccine. By this vaccination I believe I have reduced the risk of cystitis and pyelitis, a risk which is especially present in cases in which prolonged catheterisation is required. The possible advantages accruing from these measures have, of course, to be placed beside those claimed for the anæsthetic procedures in any attempt to assess the benefits of the total operative routine.

Pulmonary Complications.

Our records, if we include the original series of prolapse operations carried out under spinal anæsthesia, comprise a total of 488 cases with two deaths—that is, a mortality of 0·4 per cent. There is no mortality from pulmonary complications, no bronchopneumonia or lobar pneumonia, and only a small unrecorded number of cases of mild bronchitis. One

patient developed a passing pleurisy several days after the operation. This is especially significant since a relatively considerable proportion of gynæcological patients consists of stout unhealthy women in late middle life. This especially applies to those suffering from prolapse, in whom immobilisation on the back naturally predisposes to pulmonary stasis and congestion. It is common knowledge that inhalation anæsthesia, especially with ether, is apt to determine pulmonary complications. There are, on the other hand, few satisfactory records on which the measure of these risks with differing anæsthesias can be judged. Fuller[3] has recently published an analysis of the operations carried out at University College Hospital during 1927 which shows 124 cases of lung complications in a total of 1478, or 8·5 per cent. The mortality from these causes was 26, or 1·8 per cent. In 1332 cases ether was employed with a 6·9 per cent. incidence of pulmonary trouble; in 204 chloroform was used with an incidence of 6·8 per cent., in 179 local and regional anæsthesia with an incidence of 3·9 per cent., and in 16 gas and oxygen with a rate of 6·2 per cent. Of the seven cases exhibiting lung troubles after local or regional anæsthesia, four had definite and two a suggestion of previous lung complaints, which clearly determined the choice of anæsthesia. Fuller's analysis shows that women are less apt to suffer than men, the respective incidences being 6·8 and 17·8 per cent. A further feature of interest is that the risk had no intimate relation to the length of the operation, but was signally dependent upon site. These figures bring out in a very startling way the risk of post-operative lung complications in surgery and, whilst they show that such factors as site of operation and sex are significant, they cannot but raise in a very acute form the question as to how far the choice of anæsthetic plays a dominating part. For an accurate verdict on this matter, however, it is essential to obtain large records of approximately similar classes of case in which different anæsthetics are employed. This becomes especially apparent when the greatly differing mortality from operations on different sites is noted. In Fuller's figures, for example, the mortality from pulmonary causes in upper abdominal operations was 3·3 per cent., and in lower abdominal operations 1·1 per cent., whilst in major operations on the mouth, pharynx, and larynx it was 23·1 per cent.

At the present moment our lack of knowledge tends to place us in the invidious position of refusing the services of one anæsthetic because of the dread of immediate disaster, when in reality by our choice we may inadvertently be multiplying many times the total risks to our patient. Only by an assessment of the total advantages and disadvantages, including the risk per 1000 cases, both immediate and from such subsequent causes as toxæmia and lung complications, inherent in each anæsthetic, can we hope to escape from the present unscientific position in which the choice of anæsthetic must often be largely a matter of personal bias on the part of operator or anæsthetist. Meanwhile I am satisfied that in avertin we possess a method which is unequalled for safeguarding the patient against the mental distress and physical discomfort commonly associated with anæsthesia, and that, at the same time, its administration in combination with a reduced ether inhalation, if carried out with care, is efficient and safe. Further, the comparative figures, although admittedly still limited in their scope, suggest that by means of avertin we are protecting the lives and promoting the recovery of our patients.

Conclusions.

1. Employed according to a method tested by experience, avertin is a safe anæsthetic.

2. From the point of view of the patient's sensations, both during induction and in the post-operative phase, it is greatly superior to inhalation methods.

3. With it, post-operative sickness and pulmonary complications are minimal.

4. The special dangers are those that arise from respiratory depression and lowering of the blood pressure. In this series these risks have not proved serious, and were outweighed by the great advantages gained in other respects.

5. In about 75 per cent. a greatly reduced inhalation anæsthesia with ether has been used to supplement the avertin, and with this the results have been satisfactory.

References.

1. Morrin, F. J.: THE LANCET, 1929, i., 448.
2. Blomfield, J., and Shipway, F. E.: Ibid., 1929, i., 546.
3. Fuller, C. J.: Ibid., 1930, i., 115.

Clinical and Laboratory Notes.

A CASE OF INTUSSUSCEPTION IN ACUTE LYMPHATIC LEUKÆMIA.

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As we have only been able to find one recorded case of intussusception in lymphatic leukæmia,[1] we think the following account may prove interesting.

The patient, a girl aged 4 years, was brought to the Bolingbroke Hospital on May 10th, 1929, complaining of colicky abdominal pain and constipation lasting for three days, accompanied by frequent vomiting during the last two days. The pain was chiefly centred about the umbilicus and upper abdomen. The temperature was 98·4° F., the pulse-rate 90, and the respiration-rate 20. The child was well developed and, in spite of a drawn, anxious expression, had a high colour in her cheeks. Her tongue was dirty but moist, and nothing unusual was found in the mouth, pharynx, heart, or lungs. The abdomen was slightly distended, particularly in the central part, and a vague mass was felt extending across the abdomen at about the level of the umbilicus. The mass was mobile and tender. Rectal examination was quite negative. A soap enema resulted in the passage of a large constipated stool, but the pain and vomiting continued and the mass remained.

A diagnosis of acute obstruction, possibly due to an unusual type of intussusception, was made and laparotomy was performed.

At the operation some clear straw-coloured fluid was found in the peritoneum and the mass proved to be an "enteric" intussusception, consisting of jejunum; the apex was to the right of the middle line and could be felt in the gut about nine inches from the neck. The intussusception reduced with ease to the last two inches and then only with great difficulty. The gut composing the apex appeared to be doubtfully viable, and moreover a small tumour about half an inch in diameter could be felt at the apex. This tumour, arising in the gut wall, felt firmly elastic and sessile. As it seemed likely to be a sarcoma, the gut was resected, its continuity being repaired by side-to-side anastomosis. The abdominal incision was closed without drainage. No splenic enlargement was noticed at the operation.

The patient, though in poor condition immediately after the operation, responded extremely well to ordinary anti-shock treatment. On the third day she had a good bowel action, and her abdomen caused no anxiety after the first 48 hours. It was noticed that, for so rosy-cheeked a child, she seemed to be strangely listless and apathetic, but in view of her excellent recovery from such a severe an operation we failed to associate this with the insidious onset of leukæmia. She was discharged 28 days after her admission, her wound soundly healed.

Dr. W. Newcomb kindly examined the resected gut and reported that the tumour consisted of partially infarcted small intestine with considerable extravasation of blood into all coats. The mucosal surface was secondarily infected

[1] West Lond. Med. Jour., 1920.

with numerous pyogenic organisms, and there was a considerable infiltration of leucocytes. Dr. Newcomb was of the opinion that the hæmorrhage was secondary to this, and he failed to find any evidence of leukæmia in the gut itself.

A fortnight later the child was readmitted complaining of pain in the right leg of two days' duration. Her parents reported that since her discharge she had been in poor health but without any definite symptoms, apart from listlessness; there had been no vomiting and the bowels had been well open and the stools normal in colour.

Her temperature was then 101·4° F., her pulse-rate 130, and her respiration-rate 40. She looked ill, was pale, listless, and uninterested in her surroundings. There were a few petechiæ over the left clavicle and on the left arm. The mucous membranes were pale. There was no bleeding from the gums, nor was the mouth ulcerated. The fundus oculi, heart, and lungs were normal, and nothing abnormal was found on clinical or skiagraphic examination of the right leg. The spleen was now easily palpable about two inches below the costal margin. The liver was not enlarged, and there was no palpable enlargement of the lymphatic glands anywhere.

An examination of the blood, for which we are indebted to Dr. A. Piney, revealed: 2,752,000 red corpuscles; 28,600 leucocytes; and 70,000 platelets; hæmoglobin percentage of 45; and a colour-index of 0·83. A differential count showed: neutrophile myelocytes, 9·9 per cent.; monocytes, 1·2 per cent.; lymphocytes, 86 per cent. (and of these 84 per cent. were small non-granular); lymphoblasts, 1·3 per cent.; premyelocytes, 0·6 per cent.; and Turk cells, 0·7 per cent.

The child was treated with deep X rays, but with no benefit, and she was taken home, where she died a few days later. No autopsy was possible.

Unfortunately, no cytological examination of her blood was performed at the onset of her illness, and therefore we have only presumptive evidence that she was suffering from leukæmia before the operation. But, judging from the analogy of the very occasional occurrence of intussusception in what are eventually established to be cases of Henoch's purpura, we believe that we are justified in recording this as a case of intussusception arising in acute lymphatic leukæmia.

We wish to thank Mr. V. Zachary Cope and Dr. Stanley Wyard for permission to publish this case.

FOUR CASES OF SONNE DYSENTERY.

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The organism first isolated and described by Sonne [1] in 1915 has been widely recognised abroad. In 1924 Smith [2] reported its occurrence in Scotland, while two years later Frazer, Kinloch, and Smith [3] concluded that it was the most common cause of dysentery outbreaks in Aberdeen. It was not isolated in England until 1926 when Channon [4] described a case, and her case was atypical in not fermenting saccharose. Subsequently cases were reported by Clayton,[5] Evans,[6] and Clayton and Hunter,[7] and Nabarro [8] showed that *B. coli anaerogenes*, which he had frequently isolated at the Hospital for Sick Children, was identical culturally and serologically with *B. dysenteriæ* Sonne. Kerrin[9] in his review of the subject concluded that the organism was a serological entity, distinguished from the *dispar* group by the fact that it was indol negative and xylose negative.

The present account relates to a small outbreak of dysentery in the children's ward of the Westminster Hospital, in which *B. dysenteriæ* Sonne was isolated from the fæces in all four cases.

Case 1.—A boy, aged 1¼, was admitted on Nov. 24th, 1929, with a history of diarrhœa of two days' duration. He came direct from an institution, of which he had been an inmate for the previous four weeks, and it has been found on inquiry that there were no other cases of diarrhœa there at the time, and none developed subsequently. His temperature on admission was 102·4° F., and he presented a picture of extreme dehydration with sunken fontanelles and scaphoid abdomen. His illness ran a severe course for six days with moderate fever and 7–8 daily stools containing blood and mucus, after which he made a rapid recovery. Treatment during the early stages consisted in the oral administration of half-normal saline. This case was undoubtedly the source of the outbreak, which involved the three other children within four days.

Case 2, aged 1½, was convalescent after drainage of an appendix abscess, and developed fever (102·7°) and mild diarrhœa with blood and mucus in the stools on Nov. 26th. The acute stage lasted 48 hours, and recovery was rapid.—Case 3, aged 1, a case of tonsillectomy, was discharged on Nov. 25th, and was readmitted the following day because of the onset of diarrhœa with the passage of fœtid stools containing blood and mucus. Temperature on admission was 101·4°, and the diarrhœa and fever lasted for four days.—Case 4, aged 1¾, a case of pyelitis, had a rise of temperature to 100·4° on Nov. 28th, and during the night passed six stools containing blood and mucus. The temperature was normal on the following day, and there was no further diarrhœa. In all four cases fat was withheld from the diet during treatment.

The stools were sown on MacConkey plates, and in each case bluish-white colonies were isolated, which showed the following characteristics. In subculture the surface of the growth became rough. Mannite, glucose, and maltose were acidified in 24 hours. Gradual and persistent acidity occurred in litmus-milk. No indol formation could be demonstrated. The times taken to form acid in lactose and saccharose are given in Table I.:—

TABLE I.

Case.	Lactose.	Saccharose.
1	8th day.	Doubtful trace.
2	9th day.	10th day.
3	7th day.	11th day.

Emulsions of the organism in saline from agar slopes were agglutinated against the five Oxford Flexner sera, and also against the Oxford Sonne and polyvalent Flexner sera. The results are shown in Table II.:—

TABLE II.

Case.	V	W	X	Y	Z	Polyvalent (1/5 of full titre).	Sonne (full titre).
1	−	−	−	−	−	+	+
2	−	−	−	−	−	+	+
3	−	−	−	−	−	+	+
4	Not done.						+

The organism isolated from Case 4 died rapidly in subculture and provided material too scanty for agglutination purposes.

Dr. A. D. Gardner, of the Oxford Standards Laboratory, has very kindly repeated the examination of the organisms and confirmed my findings.

The points of interest in this outbreak are firstly the extreme rapidity with which a case of dysentery may light up infection in a ward in spite of the most rigid precautions, and secondly the mild nature of the symptoms, which appears to be the rule in infection with *B. dysenteriæ* Sonne. That a fatal result may ensue, however, is shown in the cases reported by Evans [6] and by Clayton and Hunter.[7] My thanks are due to Dr. Donald Paterson for permission to publish these cases, and to Dr. Braxton Hicks for his help and advice during their investigation.

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Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF SURGERY: SUBSECTION OF PROCTOLOGY.

A MEETING of this Subsection on May 14th, with Mr. CECIL ROWNTREE in the chair, was devoted to a discussion on

RADIUM IN CARCINOMA OF RECTUM AND COLON.

Sir CHARLES GORDON-WATSON said that in 1927, in reporting to the subsection a series of 15 cases extending over less than three years, he had shown a woman, aged 37, whose fixed inoperable annular growth was treated by colostomy followed by perineal exposure and radiation with needles. This patient had gained much in weight, and was now in good health without any sign of recurrence. The case demonstrated that adenocarcinoma was not radio-resistant; also that when surgery was regarded as either hopeless or inadvisable, radium could, for the few, give a cure. But increased experience had shown that the percentage of failures in operable growths did not justify treatment with radium in preference to surgery, in the present state of knowledge, unless surgery was contra-indicated on general grounds, or unless the patient would not submit to colostomy and excision. Though he had treated over a hundred cases of carcinoma of the rectum with radium in five and a half years, he still felt that he required more experience before he could express definite opinions about the methods to be adopted or the likely results. But it would be useful to record some impressions.

A great stumbling-block was the difficulty of approach. If surgical access was easy, a good reason must be advanced for preferring radium to radical surgery. Some operable cases which seemed to offer good prospects had either responded and relapsed, or had failed to respond appreciably to radium, so that radical treatment by surgery was subsequently needed. How far preoperative radiation was a factor in preventing recurrence could not yet be stated. Dr. Cuthbert Dukes's recent work on the classification of rectal growths examined after excision had raised the question of the treatment of early operable growths. Dr. Dukes distinguished between the "A" case, in which there was as yet no infiltration of the muscular coat, the "B" case, in which infiltration had not passed beyond the muscular coat, and the "C" case, in which there was involvement of the perirectal tissues. His figures, based upon 100 cases, seemed to show that there was no danger of lymphatic spread in an "A" case or a "B" case, and therefore that local resection might be all that was needed to effect a radical cure. Dr. Dukes maintained that local resection might be accomplished, under the most favourable conditions, with restoration of function and without a serious stricture or a permanent colostomy. If, said Sir Charles, this could be established as surgically sound, considered from the point of view of risk of recurrences, it would be necessary to promise a high percentage of success with radium if radiation was to be given preference. At present this promise could not be given. Sometimes an operable growth which had been treated without colostomy retrogressed to a point, and then seemed to remain stationary owing to chronic sepsis.

Inoperable and Borderline Cases.

Individual standards of operability varied, but there was general agreement in defining the advanced inoperable case—i.e., the large, fixed, annular growth, which had infiltrated through the rectal wall in all directions. It was recognised that after colostomy—in the absence of liver metastasis—both the general and the local condition of the patient usually improved. If colostomy was followed by irradiation, it might not always be easy to say whether general and local improvement was the result of irradiation or colostomy or of both. Sir Charles's own experience showed, even in cases submitted to colostomy some months previously and to irradiation, that rapid and marked general improvement followed irradiation, even in the absence of any definite local changes. The outstanding problem was to secure adequate and uniform irradiation, and for this a combination of methods was sometimes necessary. If at the time of colostomy the growth extended above the perineal reflection, it was essential to treat this portion from the abdomen, either by radon seeds or radium needles. The glandular area in the mesorectum was treated at the same time. Very large and advanced growths should not be dealt with by the posterior open operation, owing to the risks of perforation and secondary sepsis. Often these cases were much relieved by perirectal and intrarectal attack. In several instances an operable or borderline case had been treated with radium with such improvement that radical excision could subsequently be done. Thus it seemed that borderline cases offered the most useful field for irradiation, either as a forerunner of excision or as affording some prospect of cure.

Dealing with abdominal irradiation, Sir Charles said he began treating high rectal growths with radium through the abdomen in January, 1928, and had now treated 26 cases by the abdominal route. The method was not without risk, and he had lost one case from peritonitis. Great care was needed to avoid puncture of the bowel, which was more likely with needles than with seeds. The first stage of the colostomy was carried out at the conclusion of the radiation. When he used radium needles within the abdomen he had them filtered with 0·8 mm. of platinum.

Recurrence after Radiation.

The speaker's experience was that recurrence was more likely after using radon seeds than after using needles, perhaps because the needles gave a more uniform intensity, though this defect in the seeds might be partly mitigated by adding more radon at short intervals. He had no doubt that primary irradiation increased radio-resistance to secondary applications, and improvement of technique was a necessary condition to further advance.

In young people rectal carcinoma grew rapidly, metastasis was early, and the end-results of surgery were not good. An actively growing carcinoma in a young subject responded well to radium, and far better than a slowly growing carcinoma in an elderly subject. If a growth was adequately barraged with radium and showed little evidence of retrogression after two months, it was probably useless to repeat the irradiation; but if the growth responded to radium and retrogressed, further irradiation could be carried out, on the ground that the first dose was probably insufficient. Secondary irradiation was less likely to produce a good final result than an adequate primary irradiation, and it was more likely to produce neuralgic pain, which might be lasting. The criteria of a correct dose were: absence of sepsis, a well-marked radium film, rapid resolution of growth, restoration of normal epithelium, and a limited fibrosis. Radium had its uses, also, in improving both the local and the general conditions of an inoperable case, so that operation then became feasible. The treatment of cancer of the rectum by radium was still in the nursery stage.

Sir Charles Gordon-Watson exhibited his cinematograph film showing the operative procedure.

Discussion.

Dr. A. LACASSAGNE (Paris) said that neither new nor old techniques of radiotherapy had brought about the cure of rectal cancer, and the removal of this disease still remained primarily surgical. During the last ten years 50 patients were treated for this condition by radiotherapy at the Radium Institute of Paris, but most of the cases were so advanced that extirpation was out of the question.

Some of them when they presented themselves at the Institute had already been treated by other means. With the help of surgery, two of the patients had remained free of their cancer for four and eight years respectively. His view was that the poor results obtained in rectal carcinoma from radium were due to the low radio-sensitivity of adeno-carcinoma of the rectum. The general conclusion of himself and his colleagues was that for malignant growths in this part of the body surgery remained the treatment, and hence radiotherapy was used only as a palliative in inoperable cases. The two favourite means of application were transcutaneous irradiation and telecurietherapy.

Mr. STANFORD CADE agreed that correct surgical excision of these growths gave the patient as good a chance of cure as could at present be hoped for. A similar statement was once made, however, in regard to buccal cancer; therefore, the attitude of the profession towards cancer of the rectum might conceivably be altered in a few years' time. In the selection of cases for irradiation the points which should influence the decision were: operability, the age and general condition of the patient, and the possibility of obviating colostomy. One difficulty was to avoid radium burns, for in order to irradiate strongly enough to bring about retrogression of the growth the strength had to be very near the toleration point of normal tissue. The growths needed pure gamma rays; when the multiple method was used beta rays were given off in the area. Filtration and screening were of the utmost importance. The intensity should vary with the nature of the cell concerned, with the presence or absence of mitosis, and its secretory activity. There was a threshold of intensity and one of time, and if these were not reached irradiation would be a failure. Uniform intensity could be gained by using the actual radium salt. Radium was the only means of treating cancer of the rectum which offered the possibility of avoiding colostomy, but for annular growths colostomy was unavoidable. Insertion of radium into the lumen of the bowel was the least satisfactory method of application; it could be no more than a palliative in otherwise unsuitable cases; it should then be supplemented by the inter-rectal interstitial method. Treatment by "bomb" irradiation was still under trial, and he did not think that generalisations could yet be made about it. Results should be classified as immediate and remote. In a small percentage of cases no obvious sign of disease remained three or four years after the use of radium; radium lessened hæmorrhage, pain, and discharge, and if metastases occurred, they did so later than if it had not been used. Of 700 inoperable cases treated in this way 150 survived and remained in good health for quite an appreciable time.

Mr. J. P. LOCKHART-MUMMERY remarked that the radium treatment of cancer of the rectum must still be looked upon as experimental. Many of the results had proved disappointing, though occasionally brilliant results were seen. Filtration should never be less than 0·8 mm. and it might be well sometimes to go to 1·0 mm. With less than 0·8 mm. there was too much necrosis of the tissue surrounding the needles. His experience was that small doses given for a long time gave better results than large doses for short periods, and ten days was a better period of application than seven days, other conditions being equal. The greatest difficulty at present was that of dosage. The milligramme-hour formula he regarded as useless; to be of service the formula should include the cubic capacity of the growth, but as there was no means of measuring this it was better to go on without a formula. His own suggestion for a formula was cubic capacity of growth, multiplied by the number of milligrammes of radium, multiplied by the number of hours. Access was not difficult when the growth was low down on the posterior wall of the rectum, but with growths on the anterior wall, or high up, there were great difficulties. In the case of anterior wall growths he separated the rectum from the prostate (in the male) and from the vagina (in the female), and placed lead foil covered with rubber tissue or other protective in front of the needles to prevent damage to bladder or urethra or the posterior vaginal wall. In women he preferred not to approach the growth through the posterior vaginal wall itself; it was better to dissect up the vaginal wall. For growths in the upper part of the rectum it was necessary to secure free general mobilisation. A large incision should be made, and the coccyx should be removed, and also, if necessary, a portion of the sacrum, the rectum also being mobilised as much as possible, so as to allow the needles to be accurately placed. He did not pack the wound, but closed it with threads inside it temporarily, and when the needles had been removed he drained freely in all parts. The lines of spread in the lymphatics could be treated at the same time. The greatest difficulty was experienced in irradiating the abdominal cavity. Here radon seeds were best, for needles placed in the abdominal cavity caused some peritonitis. He did not think preliminary colostomy was always necessary. One of the greatest difficulties was to deal with the wound after irradiation; the wounds presented a yellow "washleather" slough on the whole surface, and they were very indolent. Treatment with antiseptics was useless and was liable to cause hæmorrhages. They were best treated, he thought, with light packing with vaseline gauze, or gauze soaked with oil. Overdosage with radium was liable to cause excessive fibrous tissue formation, and many of the early failures were due to overdosage rather than to underdosage.

At present the best results were obtained in the early operable cases, in which radium was used because there was some contra-indication to resection. But he did not think that radium treatment for rectal cancer had yet given such good results as to justify its use as a substitute for operation, though it might be useful in conjunction with operation in allowing more local resections to be carried out. By using a combination of the two methods he had several times saved a patient from colostomy, and the results had been satisfactory. The best results he had seen had been in cases of epitheliomata; here the disappearance of the growth began any time after the first six weeks, and, in a good case, it was then rapid. The site of the growth became normal tissue and was smooth and soft, and there was no sign of there having been a growth. Radiation was particularly suitable in very old people who, usually, were not good subjects for surgery, and if the growth was detected fairly early colostomy would not be needed. Radium in the treatment of rectal cancer had definitely established itself as a means of getting rid of the growth in suitable cases, but at present its greatest use seemed to be as an auxiliary to surgery.

Mr. W. S. PERRIN said that many of his inoperable growths in this region were substantially relieved by radium. He preferred the needles put into the abdomen, but they could be put in from the outside through the skin round the anal margin. He referred to his use of radium in four operable cases. The first was in a man aged 63, whose growth was 4 cm. in diameter and was on the posterior rectal wall, a typical adenocarcinoma. He was given 6000 mg.-hours. The perineal wound healed in a month, and he was back at work in two months. He had been kept under observation 20 months, and remained well, except for a small lump, a piece of which was pronounced to be normal tissue. Another was a man aged 48, with a similar growth, and he had 6800 mg.-hours. Later he had two small sinuses which took four months in healing. Three small lumps remained, which Mr. Perrin tried to get rid of by means of radon seeds. On failing to do so he then resorted to diathermy. In neither of these men was colostomy performed. The third patient was a woman aged 60. Ten months ago he gave her 6800 mg.-hours irradiation, but the growth was unaffected. She remained in hospital two months,

then went to a convalescent home, but returned with the wound broken down and a perineal fistula, with the fæces discharging through the perineum; indeed in a lamentable condition. He did a colostomy upon her, and the wound was not yet healed. The fourth case was, like the third, operated upon ten months ago, and the patient was a woman, aged 56, with a larger growth. She was given 7600 mg.-hours, and she had severe pain. The perineal wound did not heal, and she had to have a colostomy. After that experience he did not feel justified in recommending radium for operable growths of the rectum if surgery was possible.

Mr. LIONEL NORBURY commented on the way in which apparently similar growths reacted differently in different patients. He exhibited a specimen from a case which had failed to react to radium, and the only reason he had gleaned for this was that the growth was very colloid, and so was radium-resistant. There was a great field in the direction of increasing the radio-sensitivity of growths. In deep X ray therapy effects were enhanced by painting the area with fluorescein, or giving that substance in capsules by the mouth.

Mr. E. T. C. MILLIGAN said radium offered a means of treatment with the hope of good results in carcinoma of the anal canal and anus. When radium burns followed treatment of rectal growths by this method, the conversion of the burn into a diathermy burn would abolish the pain and produce healing. He was indebted for this valuable advice to Dr. James, of America.

Dr. JAMES confirmed this last remark, and referred to several cases.

Mr. W. TURNER WARWICK said the majority of growths seemed to react better to a small dose used for a long time than a large dose used for a short time. In assessing the type of growth, he thought the layer involved and the type of tissue reaction should be taken into consideration. Until these matters were placed on a standard basis he did not think one could even begin to argue whether radium was suitable or unsuitable.

Dr. CUTHBERT DUKES pointed out that the classification which had been made of these growths into A, B, and C was from the point of view of prognosis, not as to how the radium should be given. It had been found that there were no lymphatic metastases until the growth had spread into the perirectal tissues. The grouping of these growths according to the type of malignant cell was of no use in rectal growths because they were always heavily infected by bacteria.

The PRESIDENT in closing the discussion referred to the great duty of the surgeon to fortify himself with all possible information so that he could best advise educated people about their particular case. These patients had an especial horror of colostomy, and would avail themselves of anything which would obviate it. Team-work would, it was hoped, succeed in bringing to a practical issue the important question of radio-sensitivity.

SECTION OF UROLOGY.

AT a meeting of this Section on May 22nd, with Mr. FRANK JEANS, the President, in the chair, a discussion took place on the

TECHNIQUE AND RESULTS OF PROSTATECTOMY.

Mr. KENNETH WALKER, in opening, said he had for some time been impressed with the differences in technique followed by surgeons in England in doing prostatectomy. The nearer one got to perfection the less was there likely to be variation in practice, and the fact that technique varied so greatly surely meant that perfection was still a long way off. He hoped speakers would lay stress on their failures and difficulties rather than on their triumphs.

The three major difficulties encountered in convalescence after this operation were hæmorrhage, sepsis, and perhaps post-prostatic obstruction. Hæmorrhage he regarded as the most serious of these. In earlier days when doing the Freyer operation he tried packing when oozing occurred, and there were many failures from it, one of the chief disadvantages being the necrosis and the unpleasant state of the bladder and urine when the packing was removed. Then for two years he employed bags, but he had several cases in which bags did not satisfactorily control the hæmorrhage; in many cases they did not exert uniform pressure on the prostatic cavity. When Sir John Thomson-Walker read his paper on the open method of prostatectomy, it was clear that it was a step in the right direction; it was an attempt to convert a blind method into one of precision and control under the eye. But, though the operation was often excellent, there were cases for which it was manifestly unsuited—at any rate in the speaker's experience—for the extra time required was dangerous or might be fatal. Some had prostates very low and difficult to expose, and for these he had given up the operation. From Australia had recently come an attempt at even greater precision, by Harris. Mr. Walker had not yet had enough experience of it to enable him to pass a final judgment on it, but he knew that with a sharp boomerang needle considerable hæmorrhage could be caused by putting into position lateral sutures for obliterating the canal.

The surgeon must vary his technique with the particular patient. Wherever he could Mr. Walker performed the open operation; and he did not spend a long time in trying to secure bleeding points deep in the prostatic cavity. If bleeding did not cease after placing the suture he packed lightly. Recently, in the cases not suited for the open operation, he had gone back to packing, because he found that with a tube and mercurochrome frequently instilled the severe sepsis could be got over. Hæmorrhage might occur three, five, or more days after removing the packing, apart from secondary hæmorrhage, so he now left the pack in for six or seven days. The chief disadvantage of that was that it increased the amount of painful spasm from which the patient suffered. He did not tie and leave in a catheter at the time of the operation, but he found a catheter was useful a little later in draining the rather septic bed of the prostate, and, still later, during the final stages of convalescence and the healing of the wound. He had had too many cases in which the bladder mucous membrane had become adherent to the scar, and so required secondary suture. He asked what was the reason for that.

Three Operations Compared.

Mr. SWIFT JOLY said that the cases he had dealt with at St. Peter's Hospital could be grouped under three main operations. The first was the old Freyer operation, of which he had had 198 cases, with 19 deaths (9·5 per cent.). Four of those deaths occurred the first day after the operation, and were due to a combination of shock and hæmorrhage. Next he began packing his cases, having special packs made of vaseline gauze soaked in acriflavine. This method was used in 159 cases, and among these he had had 14 deaths (8·8 per cent.). In this series none of the patients died immediately after the operation; one death occurred as soon as the packing was removed, but the other fatal cases were in the second or third week. The third operation, of which he had had considerable experience, was that of Thomson-Walker, and it had given him the best results of any. He had done this in 207 cases, and the deaths numbered 17 (8·4 per cent.). In changing from one operation to another he had experienced a gradually decreasing mortality. In the last series of cases the deaths were from the following causes: one from a possible pulmonary embolism on the ninth day; one from myocarditis 15 days after operation; one from influenza in the third week; four from pneumonia or broncho-pneumonia (two of these died during an epidemic of influenza in the ward and two from pyelonephritis). With the use

of the Thomson-Walker method the immediate deaths were wiped out; he attributed this result to more perfect hæmostatis and to the fact that cases were certainly less septic. With the use of the flavine pack the chief trouble was pain, and there was liability to hæmorrhage after removal of the pack. Hæmorrhage was more common in convalescence when packing was employed than when it was not. He would now be sorry to go back to any operation other than the Thomson-Walker, especially as the ensuing shock was practically negligible. A series of blood pressure examinations showed that when local anæsthesia was employed there was no fall of blood pressure during the preliminary incision and the cutting into the bladder, but there was a fall during the enucleation of the prostate, and the fall continued during the stitching up of the prostatic neck and carrying out the general toilet of the wound. Then the blood pressure rose again. After the Freyer operation nearly every patient had a permanent pyuria; but by means of a flavine pack one could get rid of that in a month. Now, after doing the Thomson-Walker operation, 20 per cent. to 30 per cent. of the patients had clear urine when they left the nursing home or hospital, and it was clear still a month after they left the hospital. And this was the only operation after which he had not had recurrence at the neck of the bladder after operation. He had tried, at one time, what was practically a Harris operation, but there was a bad secondary contraction afterwards. The flap he made lived, but the stitches cut out and the urethra separated from the bladder. In another case the flap became septic and sloughed away, and the patient was worse off than before. The prostatic bed was not an ideal site for doing a plastic operation. It was well known that in plastic surgery complete asepsis was a sine qua non, but that could not be obtained in this region after prostatectomy.

Technique and Management.

Mr. JOHN EVERIDGE said the preliminary treatment of the patient before doing prostatectomy was very important. A few days spent in hospital or nursing home before the operation was a great advantage; it enabled the patient to get accustomed to the surroundings and the diet and the regulation of the bowels. The mouth should be clean, and if defective teeth were present they should be removed before the operation if possible. The anæsthetic he preferred was light open ether with novocain infiltration of the rectus muscle. He liked stovaine for these cases. He regarded the Thomson-Walker operation as ideal. When it was properly done, post-operative obstruction was almost impossible. If that operation was not possible, he carried out a two-stage operation, the second one possibly having to be delayed as long as three weeks. After the Thomson-Walker operation post-operative hæmorrhage was to a large extent prevented, though in some cases there was oozing from the bottom of the cavity. For that he employed a light gauze packing. At one time he had avoided using a bag, since it might cause a disarrangement of the sutures; but he had now returned to it. Prolonged pressure with the bag meant a risk of sepsis. When a bag was not used, there were advantages in tying in a catheter for this made continuous or intermittent irrigation possible. Most of his deaths following this operation had been due, directly or indirectly, to hæmorrhage. A common post-operative complication was ileus. He put a small tube into the rectum in these cases at the end of the operation to facilitate escape of flatus; furthermore, nourishment could be introduced into the rectum through the tube. In 150 cases he had eight deaths, due directly or indirectly to hæmorrhage. In most of these the patient was being looked after by someone else at a distance away, and perhaps more expert care might have prevented some of the deaths. In two death occurred within 36 hours of the operation; hæmorrhage had been going on all the time. Two deaths occurred from hæmorrhage when the gauze packing was removed; in four the hæmorrhage came on at about the sixteenth day after operation, when the wound was almost healed. In four primary shock killed the patients. One death was from pneumonia, and one (on the fourth day) from embolus. In that series his mortality was 10·7 per cent. After the one-stage operation his deaths were 9·7 per cent., and after the two-stage 12·3 per cent.; but the latter was chosen in the worst cases—i.e., those with a higher mortality risk.

Mr. CLIFFORD MORSON said he was a supporter of the open method of suprabubic prostatectomy, not only for adenoma or simple enlargement of the prostate, but also for carcinoma. His technique was similar to that introduced by Sir John Thomson-Walker, except that he did not tie in a catheter at the time of the operation. The catheter, he considered, added to the patient's discomfort; it did not drain well, and served no useful purpose if a posterior flap of mucous membrane had been successfully dealt with. As regards immediate results, Freyer's operation gave mortality rates so low that they had never been surpassed. But prostatic obstruction occurred afterwards too frequently, and the Thomson-Walker technique had eliminated that. Rapidity of operation was very important. Hæmorrhage did not cause shock, but rough handling of the tissues did. The danger of infection of the seminal vesicles had not yet been eliminated; it was caused by fracture of the ejaculatory ducts at the time of the enucleation. Within a short time these ducts were sealed up and the seminal vesicles then presented perfect culture tubes. To excise these vesicles at the operation unjustifiably increased the severity of the procedure. To prevent orchitis he had for nine years been isolating and dividing both vasa; he had been able to promise his patients they would never have orchitis. In the last 128 cases of prostatectomy carried out by him at St. Peter's Hospital—excluding private cases—26 were complicated—e.g., by stone, stricture, or diverticulum. The remaining 102 included cases of pre-operative retention and uræmia. Of the 26 with stone, &c., two died, giving a mortality of 7·69 per cent. Among the other 102, seven died (6·8 per cent). These 128 patients were in hospital for an average of 28·5 days.

The Thomson-Walker Operation.

Sir JOHN THOMSON-WALKER said that the operation he advocated consisted of a long incision, and enucleation with the fingers, after the Freyer method, the placing of the patient in the Trendelenburg position, exposure of the base of the bladder, removal of nodules and tags, and enlargement of the opening from the bladder into the prostatic cavity, followed by control of the hæmorrhage, either by a continuous suture or by a suture round each vessel which was seen to be bleeding. If this did not stop the bleeding he did not prolong the operation by looking for bleeding points, but packed round the catheter which he had drawn into the bladder. After that it was important to prevent pelvic cellulitis. He always retained a catheter to aid washing out, not for drainage at this stage; more and more he did continuous irrigation, and that was easy with a retained catheter and with bags. Bags were very useful in after-treatment; boric crystals were placed in the box, and when the urine trickled down it formed with the crystals a boric lotion, thus producing an antiseptic atmosphere round the end of the catheter, and he also dressed the penis. He had a preference for constant irrigation with very weak nitrate of silver solution, and that could be carried on three or four days after the operation.

The objects of his operation were to prevent sepsis, to control hæmorrhage, and to prevent obstruction, and he thought it went far to prevent those three grave complications. During the last six years his private patients had passed urine on the eleventh day after the operation, on the average, and the wound was dry on the sixteenth day. He agreed that not

all cases could be treated by this method; there was no operation in surgery into which every case could be fitted. In cases of severe infection of bladder and kidneys it was necessary to drain the bladder by suprapubic cystotomy. When secondary prostatectomy had to be done he used the Freyer method. In very old and feeble patients, or those with serious complications, such as bronchitis, his object was to get through the operation as quickly as possible; placing the patient in the Trendelenburg posture might be too severe, and he did the operation by the closed method. In the 11 years 1919–29 he had done 472 prostatectomies for simple enlargement, and his mortality was 5·2 per cent. He thought that the mortality figures in private cases were better than in hospital cases because the patients were treated in separate and cosy rooms, and were attended by expert nurses and the surgeon. This expert attention was also given in St. Peter's Hospital. It was not necessary to retain the packing longer than 48 hours. If, on removing it, bleeding occurred, the pack should be replaced. He agreed about the danger of ileus as a complication, but thought it was due to toxæmia.

Further Discussion.

Mr. G. E. NELIGAN said he did not encourage his patients to pass urine within three weeks, especially as healing took quite that time, and urine was an irritant fluid. His mortality in 100 cases was 5 per cent. Secondary hæmorrhage took place in two cases, and each of those started passing urine before three weeks. The hæmorrhage was controlled by a Pilcher's bag, and one of the patients had incontinence afterwards. In three cases there was inflammation of the vas, but it did not go as far as the testicle, for he had cut the cords. Four had pulmonary embolus, of which one case was fatal, and four were found on section to have carcinoma in the adenoma.

Mr. H. P. WINSBURY WHITE remarked that until the urological surgeon had gained considerable experience he would be wise to do the two-stage operation.

Mr. JOCELYN SWAN agreed about the importance of making a long incision, to permit the surgeon to see everything; he also attached great importance to anchoring the prostate before dealing with it. Pilcher's bag he had found of great use; he put it in after the operation and anchored it to the right thigh, and then put two tubes into the bladder—one large, one small. He always drained the prevesical space with corrugated rubber. He expected his wound to be healed in 17 days. He did not hesitate to insert a catheter and use it for drainage.

Mr. CYRIL NITCH said that in 100 cases he did the one-stage operation in 41, with 9 per cent. mortality, and the two-stage operation in 59 with a 10 per cent. mortality. In his 100 cases secondary hæmorrhage occurred in seven, and epididymitis in eight.

The discussion was continued by Mr. S. G. MACDONALD, Mr. J. B. MACALPINE, Mr. E. W. RICHES, Mr. E. T. C. MILLIGAN, Mr. HOPE CARLTON, Mr. HAROLD DODD, and the PRESIDENT. Mr. KENNETH WALKER replied.

HOSPITAL ACCOMMODATION AT WORCESTER.—An official report has been issued of a conference upon the hospital accommodation of the city of Worcester between representatives of the corporation, medical men, and Worcester General Infirmary. Dr. A. J. B. Griffin, the city medical officer, pointed out that the existing services were unable to meet the medical and surgical needs of the citizens, and suggested that the pressure might partly be met by using the Shrub Hill Infirmary, formerly the workhouse infirmary, which would involve an improved nursing and an augmented medical staff. The conference decided in that sense, and the details will be settled later. Meanwhile the public assistance committee has had the word "Workhouse" chipped from the stone tablet on the front, and the words "Municipal Homes" substituted.

Reviews and Notices of Books.

HEREDITY IN MAN.

By R. R. GATES. London: Constable and Co. 1929. With 87 illustrations. Pp. 385. 24*s*.

THIS is in effect a completely revised and much enlarged edition of the author's "Heredity and Eugenics" published in 1923; the section on twins and the inheritance of twinning is omitted and we are promised a full treatment of the topic in the next edition. After a general account of the theory of Mendelian inheritance, there follow chapters on stature, hair and eye colour, and blood groups, and nine chapters on various diseases and defects; acholuric jaundice is quaintly placed among "metabolic defects" instead of in "diseases of the blood system." We then have a chapter on the inheritance of mental differences and finally, the longest and to many people the most interesting, on racial crossing. The whole is an extraordinary mine of information, and Prof. Gates has succeeded as well as could be expected in writing up a catalogue as a readable tale. The book is written quite frankly from the Mendelian point of view, and Prof. Gates has little to say of the mass studies of statistical biometry, though we should have thought that, at the lowest valuation, these had contributed something substantial to our knowledge of the inheritance of stature and of length of life; the latter incidentally appears to be nowhere mentioned, though we are told on fair authority that it is one of the best proved examples of an intensely heritable quality in man. Prof. Gates's outlook doubtless reflects his considered opinion of the constitution of living organisms, that they are made up of discrete heritable units. But it also has a definite and very useful object—to persuade those who make observations on human inheritance that they cannot possibly neglect the Mendelian point of view and must in observing and recording constantly bear in mind the possibility of alternative inheritance and segregation. At the end of the book he gives some striking examples of the segregation of racial characteristics in human hybrids. He accepts the main races of mankind as good species in the ordinary zoological sense, and points out on the one hand how man's wandering habits have led to a great deal of racial mixture and on the other how his liking for stopping at home has resulted in stabilisation and apparent purity. He marshals much evidence to show that the crossing of widely divergent human races produces on the whole an inferior progeny liable to various disharmonies, and it seems evident that if all mankind is to be mixed up into one hybrid race the process should proceed by gradual steps rather than by the direct union of nordic with negro. Such are some of the subjects which are discussed, and we heartily commend the book to all who are interested in human beings. The investigation of human inheritance is difficult and slow, but a great deal of progress has been made in recent years, and it is more certain than ever that it will soon be one of the most important parts of preventive medicine.

MALE DISORDERS OF SEX.

By KENNETH M. WALKER, F.R.C.S., late Hunterian Professor, Royal College of Surgeons of England; Lecturer in Venereal Diseases, St. Bartholomew's Hospital; Surgeon in charge of Genito-Urinary Cases, Royal Northern Hospital, and St. Paul's. London: Jonathan Cape. 1930. Pp. 191. 5*s*.

THIS book on sexual disorders is written for the general practitioner, not from the standpoint of a psychologist, but from that of a genito-urinary surgeon who calls psychology to his aid whenever he

considers it necessary. The general scope of the work will readily be grasped from an enumeration of the headings of the main chapters, which deal with such subjects as impotence, prevention and relation to marriage, homosexuality, masturbation, continence, and sterility. Mr. Kenneth Walker has approached these subjects with a knowledge of their deep importance from the psychological as well as the physiological standpoint, and has maintained a just balance between the conflicting fields of suggestion, medical treatment, and surgical interference. He discusses the controversial points involved with an admirably balanced judgment, which is particularly valuable in the section dealing with Voronoff, Steinach, and the claims of organotherapy in impotence. The chapter dealing with continence is sane and helpful. So much intemperate writing has circulated round this that Mr. Walker's sensible views are refreshing. Another important section is that dealing with sterility in the male, its detection and treatment. This is a subject which is attracting more attention than formerly, the comfortable old view that sterility was practically always the fault of the woman having been proved inaccurate.

It must have been difficult for the author to compress so much material into the space allotted him, and indeed in some places the text shows signs of excision. We should have liked to have seen the name of Acton, the British pioneer in this subject, mentioned somewhere in the text, and for a bibliography, however brief, we should have been grateful. But, apart from these mild criticisms, we have nothing but praise for the book. It is a practical work which should be in the hands of every practitioner.

TUBERCULOSIS.

The Modern Surgical Treatment of Pulmonary Tuberculosis. By BERNARD HUDSON, M.D. Cantab., M.R.C.P. Lond., Medical Superintendent, Victoria Sanatorium, Davos-Platz, Switzerland. London: Jonathan Cape. 1930. Pp. 128. 5*s*.

OPERATIVE procedures in the treatment of pulmonary tuberculosis have shown striking advances under modern technique and Dr. Hudson deserves congratulation for an excellent summary of the present position. The limitations as well as the advantages of each procedure are discussed impartially and the views expressed are mostly those of the author himself, based on his considerable experience as a physician at Davos and Montana. The first half of the book is devoted to artificial pneumothorax, the indications and contra-indications are mentioned, and methods of dealing with various complications are described. Of special interest is an account of Dr. Maurer's method of cauterising pleural adhesions. The value of oleothorax in maintaining the collapse of the lung is indicated. Thoracoplasty is a more serious procedure but in skilled hands is now far less dangerous than it was a few years ago. It should not be advised unless the patient has fair resistance, as indicated by the presence of fibrous tissue. A preliminary phrenecectomy is usually performed. The possibilities of plombage or pneumolysis are also discussed, but this, like the old operation of external cavity drainage, has largely fallen into disuse.

The book is well written and contains a great deal of information in a small space.

HANDBOOK ON TUBERCULOSIS.

By B. S. KANGA, M.D., D.P.H., Medical Officer, Turner Dispensary and Visiting Medical Officer, Turner Sanatorium, Bombay. London: John Bale, Sons and Danielsson, Ltd. 1930. Pp. 150. 5*s*.

THIS little volume has been written to place before medical students and practitioners in India a summary of modern views on tuberculosis. The author has included all forms of tuberculosis, separate chapters being devoted to disease of the bones, joints, eye, ear, and other systems. It follows therefore that only the briefest space could be given to each subject and that much matter of the first importance has had to be omitted. Some of the views expressed are not now accepted by most authorities, but in most doubtful questions alternative opinions are given.

PHYSIOLOGY OF ORAL HYGIENE AND RECENT RESEARCH.

Second edition. By J. SIM WALLACE, D.Sc., M.D., L.D.S., Lecturer on Preventive Dentistry, King's College Hospital. London: Baillière, Tindall and Cox. 1929. Pp. 228. 10*s*. 6*d*.

THE second edition of this book has been enlarged considerably by the addition of various lectures and contributions to discussions. That part of the book which appeared in the first edition in 1923 has, however, been reprinted in extenso, without revision, with the result that certain statements about vitamins which represented views then have now become out of date. Dr. Sim Wallace's views have become almost classical. The reiteration of his teaching has doubtless been an important factor in gaining some measure of acceptance for it, though it has deprived this volume of any fresh appeal. The persuasiveness which characterised his earlier books is lacking and the sober, reasoned criticism which he used to apply to other theories of dental caries is replaced by a more carping attitude. Is there really such antagonism between Dr. Sim Wallace's views and those which are based on animal experiments with diets varied in their vitamin content? Granted that the immediate cause of dental caries is the fermentation of carbohydrate foodstuffs in contact with the teeth would it necessarily follow that the structure of the teeth is unimportant? While there is much clinical evidence to support Dr. Sim Wallace's theory that the sticky quality of the food promotes caries, yet every dentist is familiar with cases in which the quality of the food fails to explain a susceptibility to caries. Equally, every dentist sees cases in which the principles of prevention, as laid down by Dr. Sim Wallace, are flagrantly violated and yet there is an immunity to dental caries. On clinical grounds it appears to us difficult not to believe that the structure of the teeth is intimately bound up with the question of susceptibility and immunity to dental caries. The experimental work of Prof. and Mrs. Mellanby strengthens this belief, but even if this work had never been done, there would be abundant reason to think that defective structure was an important predisposing factor in the production of caries.

CORONARY THROMBOSIS:

Its Various Clinical Features. By SAMUEL A. LEVINE, Senior Associate in Medicine, Peter Bent Brigham Hospital, Boston, Mass. London: Baillière, Tindall and Cox. 1929. Pp. 178. 13*s*. 6*d*.

THIS book brings under one cover the information contained in the literature on coronary thrombosis, a condition which till comparatively recently was not generally recognised as a clinical entity. In addition to reviewing the ætiology and the various clinical features, including electrocardiographic changes, the events of an acute attack are described and atypical forms and complications are considered together with differential diagnosis. The question of treatment is discussed in more detail than in any previous publication known to us, several points of particular interest being introduced. It is suggested that in the event of extreme pain, where morphia has

failed to secure relief, light ether anæsthesia may be used; in this country some practitioners might hesitate to adopt this humane suggestion for fear that, should death occur, a coroner's court might find that it had been accelerated by the anæsthetic. Dr. Levine notes that oxygen is of definite value in cases with gross œdema and cyanosis. Stimulation of the heart in the early stages is considered inadvisable; the sluggish contractions are to be looked on as a safety mechanism and for this same reason digitalis should be withheld at the early stages of the illness. Among the complications demanding special treatment the author mentions ventricular tachycardia, the onset of which can, he considers, be diagnosed in some cases without an electrocardiographic record; quinidine is the drug to use in this emergency which, if untreated, will probably prove fatal. A very complete description of the morbid anatomy of coronary thrombosis is given by Dr. Levine, and a large section is devoted to a series of case reports. In his historical survey Dr. Levine notes that we are indebted to the careful observations of practising clinicians rather than to the work of experimental investigators for our knowledge of this disease.

MEDICINE AND THE LAW.

Workmen's Compensation: the Certifying Surgeon's Certificate.

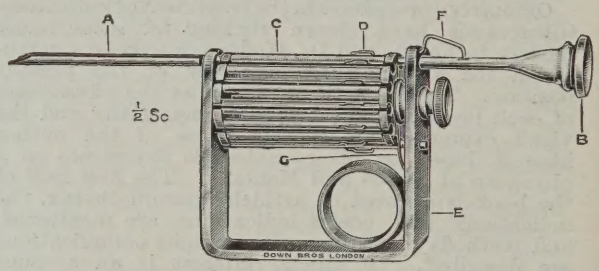
MINER'S nystagmus, as is well known, is one of the diseases which, ever since 1907, has been included in the third schedule of the Workmen's Compensation Act. Disablement due to this disease is, by virtue of Section 43, equivalent to personal injury by accident arising out of and in the course of employment; compensation is recoverable from the employer who last employed the man during the 12 months in the employment to the nature of which the disease was due. The Section further provides that the date of disablement is to be such date as the certifying surgeon certifies as the date on which the disablement commenced or, if he is unable to certify such a date, the date on which the certificate is given. There has been doubt whether the certifying surgeon's certificate of the date of disablement was conclusive. This doubt has now been resolved by the highest judicial tribunal in a Scottish case (Wilson's and Clyde Coal Co. *v.* Flynn, reported in the *Times* of May 21st) in the following circumstances.

In 1925 a miner was disabled by miner's nystagmus and, after a period of total incapacity, was paid £70 in discharge of his claim. In February, 1927, he was employed underground, and in the following November he was again disabled from the same cause and, after a period of total incapacity, was again paid £70 in discharge of his claim. From that point he was unemployed until on Feb. 14th, 1929, he went to work for the appellants as an underground miner. The arbitrator, from whose findings the above facts are taken, found that on the last-mentioned date the man was still suffering from miner's nystagmus and had not recovered from his previous disablement. After working for two hours the miner complained of headache, left the pit, and did not return. Four days later the district certifying surgeon certified him to be suffering from the disease and to be thereby disabled from earning full wages in that employment; the certificate stated that disablement began on Feb. 15th. An appeal to the medical referee was dismissed. The arbitrator refused compensation, holding that when the miner entered the appellant company's employment in 1929 he was suffering from the nystagmus contracted before November, 1927, and that thus his disablement in 1929 was not due to his employment by the appellants during the statutory period of 12 months before the 1929 disablement. This finding raised the question whether the arbitrator could go behind the certifying surgeon's certificate and say that the date of disablement was some date different from the date in the certificate. The Court of Session in Edinburgh by a majority decision declared that on the interpretation of the Act the certifying surgeon's certificate is final and conclusive. The House of Lords says that this view is correct. The result has been represented as likely to cause the employers to suffer hardship, if not indeed injustice. The certifying surgeon is not exactly a judicial authority. He does not hear the parties. He gives the employers no chance of listening to the case which the workman puts before the surgeon or of adducing evidence on their own behalf. This is hardly consonant with natural justice. Nor are the immediate employers the only persons interested; there may be a liability on earlier employers for whom the workman has worked in the past 12 months. However, as usual, the judges are not concerned with what Parliament ought to have said but with what Parliament did say. Unfortunately, what Parliament said seems liable to lead, as in the present case, to an inequitable conclusion.

New Inventions.

AN IMPROVED RADIUM NEEDLE INTRODUCER.

THE instrument consists of a hollow trocar A, with a bevelled needle point. The trocar is slotted on its upper surface, and in it passes the stilette B. C is a revolving cylinder which measures $1\frac{3}{4}$ in. in length, and contains 12 chambers each slotted on their outer surface. These chambers are for the reception of the radium needles. Each chamber is loaded with a threaded needle before use, and the threads are



drawn out of the slots on the outer surface, and pass beneath the small metal flange D which anchors them until they are required. E is the handle by which the instrument is held. The trocar is first introduced into the tissues with the stilette in position. When the required depth has been reached the stilette B is withdrawn. The catch F is a restraining catch and prevents it being drawn out completely. The cylinder is then rotated until the first chamber comes into line with the trocar. This point is automatically regulated by a ball catch. G, the stilette, is then pushed home, and the threaded needle is forced through the trocar into the tissues, the thread lying in turn in the slot on the upper surface of the chamber, and then in that of the trocar. The stilette is then withdrawn, the cylinder again turned until the next chamber is engaged, and a second needle introduced. Or the trocar may first be withdrawn and reintroduced at a fresh spot. The instrument saves much time.

Messrs. Down Bros., St. Thomas's-street, London, S.E., are the makers.

RALPH BROOKE, M.S., F.R.C.S.

THE LANCET.

LONDON: SATURDAY, MAY 31, 1930.

THE EVANS CANCER CURE.

IT is lamentable that the jury failed to agree in the action brought by Mrs. AMELIA BURRELL against Mr. DAVID REES EVANS, an unqualified medical practitioner and the proprietor of an alleged formula for the cure of cancer. Mrs. BURRELL'S case was that the defendant promised to cure her permanently in three months by herbal treatment. She charged him not only with negligence but also with fraud. The grave feature of the case was that, before the defendant's treatment began, Mrs. BURRELL was in an operable condition, but, after three months' treatment, she was inoperable and incurable. After several days' trial Mr. Justice CHARLES left three questions to the jury: (1) Did the defendant make fraudulent misrepresentations to induce, and did he induce, the plaintiff to enter into a contract to be treated by him? (2) Did he warrant to cure her permanently in three months and was the warranty broken? (3) Was he negligent in his treatment of her? After being absent from court for three hours the jury said they could not agree on the first and third questions; as to the second question, they considered Mr. EVANS did not warrant to cure Mrs. BURRELL in three months. Describing this inconclusive result as extraordinarily unfortunate, the judge had no alternative but to discharge the jury. The plaintiff, of course, is free to recommence her action before another jury. A subsequent application on Mr. EVANS'S behalf for judgment on the issue of contract was refused, the costs of the application being awarded to Mrs. BURRELL.

Regrettable as is the waste of time and money which the requirement of unanimity among jurymen occasionally imposes, the action has brought to light facts of wide interest. We now know from Mr. EVANS himself that his formula for the cure of cancer was accidentally discovered by his father (a farmer) and his uncle who, after experimenting with various remedies, successfully cured their brother of cancer of the lip. In his early days, the plaintiff tells us, he helped his father and uncle who dealt at Cardigan with 200 patients a day, working from 9 A.M. till midnight and only breaking off for tea. We know that Mr. EVANS has four formulæ in all: one of them he uses for curing duodenal ulcer, an ailment which, he explained to the judge, is of the same family as cancer. We know that he was educated at the Cardigan County School and not at any university or hospital, even though the literature which he circulates may suggest the contrary. We know that the testimonials which he publishes are not spontaneous and that his booklet, entitled the Cardigan Cancer Cure, can be judicially described as "sodden with misstatements." Suggestions were made during the trial that the orthodox medical practitioners were jealous of the success of the Evans cure and declined to put it to the test. On the other hand, Prof. LAZARUS-BARLOW, for over twenty years director of cancer research at the Middlesex Hospital and a member of the Cancer Committee of the Ministry of Health, gave evidence that Mr. EVANS had (after questions had been asked in Parliament about his cancer cure) been invited to appear before the committee. He came and brought with him printed and written documents, sworn statements, and photographs of cases which he wished to submit to the committee for investigation. The committee communicated with medical officers of health in the towns where the alleged cured patients resided, asking for information about the cases. In the majority of instances the patients were dead or had disappeared. In only two or three cases could the medical officers get definite evidence, and there was nothing to lead them to suspect that the suggested cure had ever taken place. The committee reported that they had not found sufficient evidence to carry the matter further.

Part of the publicity which the Cardigan Cancer Cure has enjoyed has been due to an article in *Light* by Mr. HANNEN SWAFFER who, in the evidence he gave for the defendant, described himself as a very well-known investigator of facts. We do not know the jury's opinion of this article but we know what the judge thought of it. "How any responsible journalist could write such wicked, misleading nonsense dealing with so terrible a thing as cancer," said Mr. Justice CHARLES, "I cannot conceive. I asked him 'do you know anything about cancer or how to recognise cancer?' and he replied 'I know nothing.' Yet he deliberately told the public that the defendant showed him photographs of malignant growths and cancers in bottles; I daresay the defendant did nothing of the kind." The evidence in the case, and the jury's inability to come to a decision upon the merits of the Evans treatment seem to show that there are many people who so trustfully believe in the magic of a secret and miraculous cure that they prefer the ministrations of an unqualified practitioner to all the known developments of medicine and surgery. Even their credulity is taxed when Mr. SWAFFER'S article tells them that "Little is done in hospitals except to perform operations which only delay inevitable death." Mr. EVANS himself, it may be, viewed the prospects of the recent litigation with anxiety. At any rate he transferred his money into his wife's name a month after the issue of the statement of claim. Nevertheless he can claim that the jury accepted his statement that he did not warrant to cure Mrs. BURRELL permanently in three months. Simultaneously with these civil proceedings in London in Mrs. BURRELL'S claim for damages, a herbalist named JAMES MASSEY was being tried at Manchester Assizes on a criminal charge of manslaughter. The prosecution called evidence to show that the accused, an unqualified practitioner, had treated a woman for some months and by criminal neglect and ignorance had aggravated her cancer; if properly treated, she would probably have recovered. He was found guilty and was sentenced to 15 months' imprisonment.

PUERPERAL SEPSIS.

IN the middle of the eighteenth century CHARLES WHITE, the father of modern midwifery, conducted his practice in the poorest parts of Manchester for 25 years without losing a single case from puerperal fever. ROBERT COLLINS stated in 1835 that he did not have a single death which he attributed to this cause among 10,785 deliveries in the last four years of his Mastership of the Rotunda Hospital. On the other hand, WHITE said, "It is evident that by much the greater part of the sex will do well even under the worst treatment," and it is this problem which is so baffling. Why is it that a slight slip in technique will kill one patient, while others will recover without any symptoms after "the

worst of treatment"? Some have tried to blame late coitus but without any serious evidence. W. W. KING [1] has recently maintained the thesis that hæmolytic streptococci can be conveyed to the genital tract of a parturient woman by "spraying" from the throat of an attendant, but the fact that such streptococci have been found in the throats of a high percentage of nurses makes it seem improbable that this suggestion is of much clinical significance, though it is evidently important that attendants with sore-throats should be prohibited from attendance in the labour ward. To explain the peculiarities of incidence we are driven to make use of an abstract conception—the resistance of the patient. No one seriously believes that autogenous infection is responsible for many cases of puerperal infection, but it is obvious, for instance, that an anæmic woman is less able to resist any form of infection than one who is healthy and well. H. BURTWHITE [2] appears to have been the first to investigate the relation of the Dick test to the incidence of puerperal sepsis, and this seems, on the face of it, a promising line of investigation. A fortnight ago, however, LOIS STENT showed in our own columns, from a series of 500 cases, that immunity to streptococcal toxin measured by the Dick test did not decrease the liability to a morbid puerperium. Another suggestive inquiry has been that of H. N. GREEN and E. MELLANBY working on the theory that vitamin A is valuable in protecting the body against infection. They have tried the effect of large doses of this vitamin for cases of established septicæmia, and though they have not yet proved it effective at this stage there is little doubt that diet is one of the most important factors on which the resistance of the body to infection depends. In treatment, however, there is as yet no accepted remedy. Antistreptococcal serum is held to be a useful prophylactic if given in large doses, but it has proved disappointing after the onset of frank septicæmia. Local treatment, such as REMINGTON HOBBS'S method of treating the uterus with glycerin, may be of service in selected cases, but certainly cannot be recommended for indiscriminate use; for almost every authority agrees that the less interference there is with the uterus, the better will be the patient's chances. It seems doubtful if the treatment suggested by CHARLES WHITE can be much improved upon at the present day.

It is barely 200 years since the first maternity hospital was opened. The results obtained a century ago by such men as L. J. BOER and COLLINS were extremely good, but the principles on which they based their practice were forgotten, and by 1870 the mortality from puerperal sepsis in all the maternity hospitals of Europe was so terrible that a general agitation in the lay press all but caused them to be closed. MATTHEWS DUNCAN wrote: "The mortality of maternity hospitals is said to be so great that it is expedient, indeed absolutely necessary, to close them entirely." All that he could say in their favour was that their record of mortality was nearly the same as that outside their walls, and he admitted that he knew of one hospital that lost over 30 per cent. of its patients. A. V. MACAN, who taught the profession in Dublin how to "scrub up," expressed the belief that he would be the last Master of the Rotunda Hospital. TROUSSEAU and CRUVEILHIER were also in favour of closing large maternity hospitals; but happily the situation changed again as Listerian principles were adopted by the hospitals, and their records once more became better than those of outside practitioners. Now, however, history seems to be repeating itself, for the public is suspicious and the lay press has again started an attack on maternity hospitals. A. S. M. MACGREGOR'S recent report on four outbreaks of sepsis in institutions in Scotland certainly makes it clear that the propinquity of women in lying-in hospitals is a potential source of danger, but gives the impression that the technique practised in the institutions concerned was unsatisfactory. The danger of infection in hospital is chiefly associated with infected patients, and a reference to the reports of any of the leading maternity hospitals will reveal the fact that these patients are almost always rendered septic before they are admitted. G. W. THEOBALD [3] has reported 36 such cases admitted to one institution in a single year. This suggests that if general practitioners were to do no obstetric operations other than the application of "low forceps," and were to send all other patients needing operative treatment to hospitals before they were contaminated, the risk of puerperal infection could be eliminated from hospital practice. The advantages of the institutional treatment of maternity cases are obvious, and there is not a specialist in obstetrics who does not prefer, if not insist, that these patients should enter some institution for their confinements. We cannot forecast what will be the logical deduction from the report on a sample series of septic cases in private practice, the publication of which is imminent.

[1] See THE LANCET, April 12th, p. 809.
[2] Brit. Med. Jour., 1928, ii., 974.

A DENTAL JUBILEE.

THE annual meeting of the British Dental Association, which was held in London this week, had a special significance, for in this year the Association attained its jubilee.[4] While dentistry, both as a profession and a science, is much older than the British Dental Association, yet the evolution of modern dentistry is largely a matter of the last 50 years, so that the history of the Association is in many respects the history of dental science in this country. Mr. NORMAN BENNETT, the new President, sketched the rise and progress of the Association showing how intimately this body has been concerned in all the various phases of dental activity since it commenced its career. When the Association was founded as the result of a meeting of a body known as the Dental Reform Committee, the Dentists Act of 1878 had been in existence for three years. The practice of dentistry had been actively advancing for the preceding 20 or 30 years, and the Dental Hospital of London (now the Royal Dental Hospital) had been in existence for over 20 years, and had trained many practitioners. The Odontological Society, now merged in the Royal Society of Medicine, was firmly established as the premier body devoted to dental science and dentistry, even then, was beginning to assume some of its main features which still remain in essence unchanged. There had been some sharp fights previous to the passing of the Dentists Act of 1878 as to whether dentistry should develop as a branch of medicine, or should become autonomous. This conflict of opinion, which even to-day is not yet extinct, was still acute at the time of the founding of the British Dental Association,

[3] THE LANCET, 1926, ii., 633.
[4] An admirably illustrated Jubilee Book has been printed for the Association by Messrs. John Bale, Sons, and Danielsson.

but this body played a part of considerable importance in bringing about relative unity in the profession. The first President of the Association was Sir JOHN TOMES, perhaps the most notable of the many famous men who have advanced the profession of dentistry. The Association started with 383 members. This year there are over 4000, an increase which, though slower than its members would like, has brought a majority of qualified dentists into membership of the Association.

From the first the Association had to fight hard to maintain the position of the dental profession and its claim to public recognition. The part it has played in extending the sphere of dentistry may be recalled. The naval and military dental services are post-war creations whose value is now universally recognised. But as far back as 1881, T. GADDES, an early President of the Association, pleaded for the instruction of army medical officers in dental surgery. In 1886 inspection of the teeth formed part of the examinations of candidates for the naval reserve, but the War Office refused to consider the proposal, and it was not until after the South African war that a tardy commencement was made by the appointment of a few civilian dental surgeons to the troops. Remembering what dentists did in the late war, not merely in the treatment of jaw injuries but in the less dramatic but equally useful work of treating diseased teeth and providing efficient dentures, it seems incredible that in 1914 the official establishment of the navy was three dentists, while in the army there were nine dentists at home and seven in India. On the outbreak of war the Association placed its whole organisation at the service of the Admiralty and War Office, and succeeded in the face of apathy and even of opposition in putting the dental service of navy and army on a sound basis, an achievement which has not received the recognition it merits. More important still was the extension of public dentistry in public elementary schools, a work with which the Association has been intimately connected. Papers on school dentistry were read before the Association by W. M. FISHER of Dundee, who may justly be called the pioneer of school dentistry, and whose work recently received the recognition of a pension from the civil list. Another prominent member of the Association who did much work on behalf of school dentistry was GEORGE CUNNINGHAM who, in conjunction with SEDLEY TAYLOR, founded the school clinic at Cambridge in 1907, which to-day is not only the senior clinic, but in many respects the most efficient. A committee appointed by the Association have issued since 1890 a series of valuable reports, laying down the broad lines on which a school dental service should develop.

The evils of unqualified dental practice were soon recognised by the Association, which tried to bring about an improvement in the standards of private practice but without immediate success, owing to various legal decisions which, in effect, largely nullified the intentions of the 1878 Act. The Association was closely connected with the intricate negotiations leading to the passage of the Dentists Act of 1921, which brought unregistered practice to an end, and stamped out the grosser evils of advertisement and quackery. Here Mr. BENNETT modestly said nothing in his address about the important part which he played himself in the preliminaries to the passage of this Act. For a time it seemed as though the Act would bring not peace but discord to the Association, and the controversies about the merits and demerits of the Act threatened a secession of membership. But time has healed these differences, and it is now universally recognised that, while the 1921 Act may have its flaws, and while it entailed self-abnegation on the part of the qualified dentists, yet it has brought great benefits both to the public and to the dental profession. Since the war the inclusion of dental service as an additional benefit under the National Health Insurance Act has led to a far-reaching extension of dental treatment to the industrial classes. This has implied difficult and intricate negotiations with the approved societies, in which the British Dental Association has played an important part. The results have not met with universal approval. Criticisms have been made by aggrieved dentists that the Association has sold the pass and sacrificed the interests of the dental profession. Parallel criticisms have not been unknown in the history of medical insurance practice; they are, perhaps, inevitable where a professional body has to negotiate with bodies representing different interests. But when the full story is known we believe the British Dental Association will be found to have played a statesmanlike part in its negotiations with the approved societies, and to have succeeded in obtaining conditions which, while short of the ideal, are yet a distinct and permanent gain to the dental profession and to the public. So much for the 50 years that are past. In the development of sound dental practice and policy we believe the Association is destined to play a part of increasing importance in the future.

ENCEPHALITIS IN THE ACUTE SPECIFIC FEVERS.

THE encephalitis which may follow the acute specific fevers must always arouse interest by the suddenness of its appearance and the rapidity and completeness with which it may disappear. This interest has been increased by the recent incidence of encephalitis following vaccination and by the controversy which has arisen over the causal relationship between the encephalitis and the specific fever which it may follow.[1] The large increase during the last two years in the number of published cases in which encephalitis has followed one of the acute specific fevers may be due to an actual increase in the incidence of such cases or to the prominence which has been given to post-vaccinial encephalitis both in the medical and in the lay press. We are inclined to the view that the increase is not only apparent but actual, especially as regards measles, chicken-pox, and small-pox. In this country cases following chicken-pox have been reported by D. M. WINNICOTT and N. GIBBS in London (1926) and by GRAHAM[2] in Glasgow. The Glasgow cases were of interest in that in both the chief symptom was ataxia, which fortunately was of short duration. Similar cases have been published by PAOLO GALLI in Italy (1925) and by RENDU[3] in France; the last-named author calls the condition "cerebellitis."

As to the pathological anatomy of these varicellar cases, and consequently their possible relationship to post-vaccinial and post-variolar encephalitis, we are still completely in the dark, because no post-mortem material is so far available. But in respect of the cases following measles we are on surer ground. Not only is the increased frequency of this complication of measles within the past few years undoubted, but post-mortem material has been examined in this country, on the continent, and in America with, on

[1] See THE LANCET, March 8th, 1930, p. 525.
[2] Graham, S.: Arch. Dis. Child., 1930, v., 146.
[3] Rendu, R.: Jour. de Méd. de Lyon, 1929, x., 767.

the whole, concordant results.[4] Of those who have investigated the histology of post-morbillar encephalitis some have found a purely hæmorrhagic encephalitis. Others have discovered a pathological picture which resembles so closely that of post-variolar or post-vaccinial encephalitis that it must be grouped with them (F. WOHLWILL, 1928; and J. G. GREENFIELD, 1929). This group is characterised by zones of demyelination surrounding a large proportion of the vessels in the affected regions of the brain and spinal cord, and to it the name of "acute disseminated encephalomyelitis" has been given. This name, or to be more precise "fleck-like or disseminated myelitis," was used by C. WESTPHAL in 1873 to describe the condition of the spinal cord in two cases of acute myelitis following small-pox (probably the first cases of the kind to be examined histologically), and it therefore bears the authority of age. While it is sufficiently descriptive of the pathological process, a more precise and less elastic term would be better. For there has been a recent tendency in Germany to include in this group cases which have not the sudden onset of those which follow small-pox and vaccination and in which the lesions are less definitely perivascular in arrangement. There seems to be no doubt, however, that some cases of acute myelitis which have no relationship to a specific fever may present a pathological picture of this type. Two cases are described by GREENFIELD in the current number of the *Journal of Pathology and Bacteriology* of acute myelitis following a febrile attack labelled "influenza" in which changes in the spinal cord resembling more or less exactly the lesions found in post-vaccinial encephalomyelitis were found. Such cases should certainly be included within the pathological group of "acute disseminated encephalomyelitis"; but it is less easy to assign a nosological position to the encephalitis which follows other febrile conditions. Encephalitis following German measles has lately been described in France by DEBRÉ, TURQUETY, and BROCA,[5] and last year in our own columns by J. H. E. BROCK. In their sudden onset and in their symptoms—which included neck rigidity, trismus, and myoclonic twitchings with unconsciousness—they resembled many of the cases which follow measles, but recovery was always rapid and complete. The fatal cases of scarlatinal encephalitis have usually been found to be hæmorrhagic in nature. Hæmorrhagic encephalitis also occurs after "influenza" and apart from specific fevers, and bears little or no histological resemblance either to disseminated encephalomyelitis or to encephalitis lethargica. The cases of "encephalitis" or of acute cerebral symptoms which may occur in the course of whooping-cough must, according to HILLER and GRINKER,[6] be assigned to a different cause—viz., thrombosis or spasm of small blood-vessels. They have had the opportunity of examining a case in which hemiplegia came on without any relationship to cough, so that the cerebral ischæmia which produced the symptoms could not have been due to a purely mechanical cause. Other writers have found a hæmorrhagic encephalitis in whooping-cough as in other infectious diseases.

The encephalitis or meningo-encephalitis of mumps has perhaps more claim than any of the others to a direct relationship with the virus of the disease. Not only are cases of encephalitis more common in this than in any other infectious disease (nine cases of encephalitis among 476 of mumps were reported by R. L. HADEN in America in 1919), but a lymphocytosis has been found in the cerebro-spinal fluid in a number of cases which presented no nervous symptoms. The most interesting cases are those in which the nervous symptoms either precede or replace the parotid swelling. Cases of the latter kind have lately been reported by WEISSENBACH, BASCH, and BASCH,[7] who point out that, in the absence of an epidemic, or of the development of the typical parotitis in contacts, it may be impossible to make the correct diagnosis. The severity of the initial cerebral symptoms and the presence of a high lymphocytosis in the cerebro-spinal fluid may give rise to needless alarm, for recovery is almost always rapid and complete. A few cases have, however, proved fatal. The direct causal relationship between the encephalitis and the virus of the disease which is suggested by these observations is substantiated by the experiments of MERVYN GORDON, who in 1914 reported that he had produced a fatal meningo-encephalitis in monkeys by intracerebral inoculation of filtered saliva from cases of mumps.

It is clear, therefore, that encephalitis following the acute specific fevers may be of various forms. Not only may those which follow one fever differ from those which follow another, but more than one form may follow one kind of fever. More knowledge is needed on these points and on the controversial question of the causation of acute disseminated encephalomyelitis. In the meantime we shall be wise if we restrict the latter name to the cases in which a histological examination shows that this form of encephalitis is present, and reserve our judgment as to the nature of the encephalitis which may follow varicella and rubella.

[4] See THE LANCET, 1929, i., 241.

[5] Debré, R., Turquety, R., and Broca, R.: Presse Méd., 1930, p. 348.

[6] Hiller, F., and Grinker, R. R.: Arch. Neurol. and Psych., 1930, xxiii., 634.

[7] Weissenbach, R. J., Basch, G., and Basch, M.: Ann. de Méd., 1930, xxvii., 5.

Annotations.

"Ne quid nimis."

EPSOM COLLEGE.

THE Council of Epsom College have instructed Messrs. Pite, Son and Fairweather, the well-known hospital architects, to prepare detailed plans and specifications and to obtain tenders for a new school sanatorium of 50 beds, estimated to cost approximately £25,000. It is hoped that the building will be completed in the autumn of 1931. With this decision the programme of improvements and extensions, commenced in 1924 and carried on steadily ever since, will be concluded except for relatively minor additions. Since that date there have been erected the war memorial chapel, a large chemical block, a new games pavilion, and a fine covered rifle range, with numerous other extensions to existing buildings. The erection of the new sanatorium will permit of the present one being turned into an additional house for 40 boys, bringing the total number of boys up to 440, and so enabling the admission of at least a moiety of applicants who now have to be declined. Sketch plans of the sanatorium were reproduced in these pages on Dec. 3rd, 1927, and only small modifications have been introduced into the final plans. These follow closely the lines on which the Ministry of Health consider that a model school sanatorium should be built, and the Council have received valued assistance from medical officers of other leading public schools in their aim to provide

such a building as will meet all likely needs for years to come.

Up to date only some £8000 has been received in response to the special appeal made to the profession; for this the Council have to thank generous individual donors, the British Medical Association, THE LANCET, the medical staffs of a number of hospitals, various societies and other bodies; it is hoped that still others will help to swell this sum materially, so that the Council may not have to draw largely on funds that they are anxious not to deplete. It is still open to a donor of £10,000 to give his own name or the name of any person whom he desires to commemorate to the main sanatorium, and a donor of £5000 may do likewise to a single block, while a large ward may be named for £3000, or a small ward for £1000, and a single bed for £100. All donors of ten guineas and upwards are entitled to votes, proportional to their donations, at the annual elections of Foundationers and Pensioners, and such donors become life governors of the College.

Donations will be gratefully received at the Epsom College Office, 49, Bedford-square, London, W.C.1.

LYMPHATIC ANASTOMOTIC CHANNELS.

MANY anatomists are aware of inadequacy in the standard accounts of lymphatic drainage from particular regions or organs. These accounts do not meet the requirements of clinical work, usually because little or no stress is laid on the anastomoses between lymphatic fields. The lymphatic vessels of any region or structure have a developmental or segmental value, and their drainage paths are interconnected as are those of veins. The vessels are associated closely with the veins of a part and show, with these, those evidences of long descent which are often obscured in arteries. Dr. O. W. Roberts, in the April number of the *British Journal of Surgery*, calls attention to what he terms "the dorsal lymphatic system" as a common secondary anastomotic path along which the infection of a growth may extend to far distant parts. This anastomotic utilisation is a necessary consequence of the rapid obstruction of the direct path, and indicates the need for recognition of anastomotic fields. Though the dorsal lymphatic system has not been described, so far as we know, by previous writers, we have no doubt that Dr. Roberts is right in his postulate. The system might almost be assumed on general grounds; it would correspond with the intraspinal venous drainage, issuing intersegmentally, and the plaques of growth mentioned by Dr. Roberts would correspond with laminar radicles of the issuing spinal veins. Under these circumstances the associated glands would lie near the azygos veins—in other words, would be in the posterior mediastinum—and the infections as he describes them would follow of necessity. The broad and generalised results brought out in this paper, founded on the observation of 700 cases of malignant growths, cannot fail to be of interest; with regard to the dorsal system the pathologist has been able to go further than the anatomist, although the latter has good grounds for assuming its existence.

NUTRITION OF THE YOUNG IN FRANCE.

THE question is often raised whether individual taste and traditional habit are trustworthy guides to the choice of an adequate dietary. The answer so far as the civilised races of mankind are concerned is almost certainly no; for modern machinery and transport have made it possible for men to live cheaply on incomplete yet palatable foods which may in the long run induce profound bodily disturbance. In every civilised country at the present time the feeding of the population is being examined critically in the light of nutritional research, with particular attention to the child and adolescent, in whom the results of faulty diets are more easily recognised. In France, the traditional home of the culinary art, a proposal has been put forward for the appointment of a Commission to inquire into the optimum dietary régime for children of various ages. The National Federation of Domestic Instruction is strongly in favour of the proposal, and its President, Mme. Moll-Weiss,[1] has appealed to the Académie de Médecine for support. Preliminary observations have convinced her of the need for comprehensive inquiry. She finds that the food given to children resident in institutions is monotonous and deficient in accessory factors, and only too often the same criticisms are applicable to the diets of children living at home. The breakfast of bread and coffee, almost universal, is condemned as quite inadequate to support a child through a morning of hard work. The midday meal usually comprises soup, fish or meat, a vegetable which is almost always of the dried variety, and cheese or cake; fresh vegetables and fruit are rarely served, and there would appear to be a genuine shortage of accessory factors in the diet as a whole. There is no uniformity in the quantities of basic foods allotted to children in different institutions. In one school a daily allowance of two ounces of dried vegetables is given, in another four ounces; here the meat ration may consist of two or three ounces of cooked meat, there one pound of raw meat. While it is recognised that a varied dietary is of the greatest value for any child, Mme. Moll-Weiss thinks there must be some limits to the variations in the quantities of essential basic foods compatible with optimum physical development. The feeding of young recruits in the services is considered to leave much to be desired. Not only do their dietaries fall short of the modern standards in respect of their choice of foods, but their meals are served in such primitive fashion that the young men must form the impression that food has no other function to fulfil than to satisfy hunger, whereas it would not be difficult to train them during their years of service into good feeding habits which would be of permanent value in improving the standard of nutrition throughout the country. The proposed Commission would be expected to formulate guiding principles on the nutritive requirements of the young; their recommendations would then be broadcast by specially trained teachers of domestic science familiar with the principles of hygiene, expert in constructing diets and cooking. It would be their task to see that the overlay of nutritional science does not banish from dining room and refectory the variety, the elegance, and the originality of the meals for which the French nation has so long been famed.

TUMOURS OF THE LACRYMAL GLAND.

DISPLACEMENT of the eyeball downwards without much proptosis usually suggests a frontal mucocele or a periosteal tumour, but it may also be due to a tumour of the lacrymal gland. This is a comparatively rare condition and the fact that a good many cases have been recorded in the literature is no proof to the contrary. Dr. W. L. Benedict[2] records that within the last three years five patients have been operated on at the Mayo Clinic for so-called mixed tumours of the lacrymal gland. These tumours are usually surrounded by a rather dense capsule, are slow in growth, lie in close contact with the superior orbital wall in the lacrymal fossa, may or may not involve the gland itself, and are easily removed by a brow incision when they are small. There are records in the *Transactions* of the Ophthalmological Society of the United Kingdom of these cases from 1882, when the late Mr. Henry Power showed a case under the title Fibro-sarcoma. Up till quite recently most of the cases have been called "endothelioma," but other titles have been "adenosarcoma," "lymphosarcoma," "cylindroma," and "adenocarcinoma." Perhaps the best plan is to use the non-committal term "mixed tumour," for the

[1] Bull. Acad. Méd., 1930, ciii., 417.

[2] Proceedings of the staff meetings of the Mayo Clinic, April 30th, 1930.

pathologists are no more agreed as to their origin now than they were 30 years ago. The point of practical importance is that although these tumours in the majority of instances are non-malignant, in a certain number of cases they do recur locally and may even become malignant. Mr. Leslie Paton recorded a case in 1910 in which recurrence took place in the glands of the neck with a fatal result. The treatment while the tumour is still small is easy by means of a brow incision, but sometimes surgeons have had recourse to Krönlein's operation. In case of recurrence, exenteration of the orbit has sometimes been necessary. In 1916, after a second recurrence, Mr. Finzi employed radium with apparent success. Recently, in Dublin, Miss E. Maxwell (in 1929) treated a case, first with X rays, and then with radium, but the eyeball had, ultimately, to be removed. In a case which was shown by A. Hugh Thompson[3] in 1902 in which the ordinary surgical removal had been performed, and the lacrymal gland removed at the same time, a second orbital growth of a precisely similar nature but much smaller was removed 11 years later and there was no further recurrence. Dr. Benedict states that these tumours contain adenomatous, myxomatous, and myxosarcomatous tissue with occasional regions of bone or cartilaginous tissue. Some of them have a distinctly glandular structure, but they may be quite separable from the lacrymal gland and may arise either from accessory glands or possibly from embryonal tissue in the orbit, involving the lacrymal gland secondarily.

TREATMENT OF WAR STRAIN.

IN a recent issue attention was drawn to the position of the neurasthenic ex-Service man when called upon to answer a police-court charge; his mental condition was often ignored and seldom investigated thoroughly. In civil life he was at an equally grave disadvantage, since employers were chary of engaging a man in an unstable nervous condition. Under the presidency of Sir Frederick Milner, the Ex-Services Welfare Society attempts to restore to such men their capacity to encounter the stresses of modern life. It is as disheartening for the society as for the man himself to find that he is unable to succeed in a post which has been found for him; and if it seems certain that commercial employment, with its attendant atmosphere of competition, will prove too great a strain the man is offered work in the society's industrial colony at Leatherhead. Neurasthenic patients, when working under conditions which relieve their anxiety, are painstaking and thorough, and at least capable of supporting themselves. The minimum wage offered by the society to those employed is £2 5*s*., but several of the men earn as much as £3 10*s*. New trainees are maintained free of charge at the associated hostel, and receive a weekly bonus of 7*s*. 6*d*. while training. Electro-radiant Thermega blankets and pads are manufactured at the industry, and are sold at a cost which compares favourably with foreign products of the same kind; as the directors and secretary of Thermega Ltd., are voluntary workers holding unsalaried posts it is possible to enter into successful competition with rival firms. Any profits go to the development of the industrial scheme. Medical and psychological treatment of the more serious cases is carried out at the society's homes; in many cases excellent results have been obtained among men who were previously incapable of supporting themselves. Lack of accommodation has proved a serious handicap in the past, but the society has recently taken over a new property, Eden Lodge, at Beckenham, where it will be possible to admit at least 40 more patients. The society undertakes, in addition, financial and advisory assistance; as the man with an anxiety neurosis is little likely to profit by any treatment if he is concerned for his family during his stay in hospital, the society undertakes the charge of those dependent on him while he is under treatment. The freedom from anxiety on this score is found to benefit the patients considerably. In several cases where an early mistake in diagnosis or ignorance of his just dues has left the patient with an inadequate pension, the society has been able to make successful representations to the Ministry for an increase. The constructive work of the society, which makes a responsible productive citizen of the neurasthenic who has been dependent on others for years is of economic value to the whole community; the importance of such a metamorphosis to the patient himself can scarcely be imagined.

[3] Trans. Oph. Soc., 1902, p. 252, and 1912, p. 79.

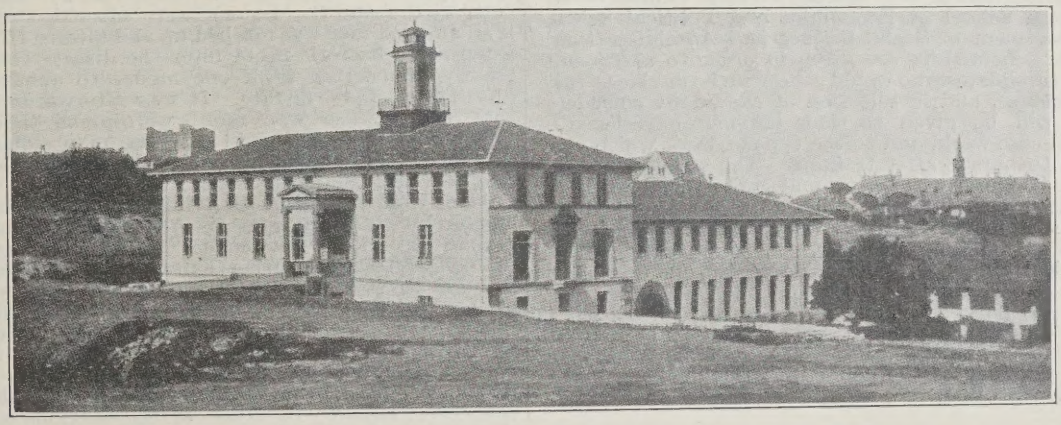
IMMUNITY TO WHOOPING-COUGH, CHICKEN-POX, AND RUBELLA.

THE first results of a research into the factors which control the spread of epidemics of chicken-pox, whooping-cough, and German measles were communicated to the Section of Epidemiology of the Royal Society of Medicine on May 23rd by Dr. Percy Stocks. After showing how recent work on diphtheria, scarlet fever, cerebro-spinal fever, acute poliomyelitis, malaria, and measles had fixed attention once more on the state of immunity of the attacked population as the main controlling factor in the spread of these diseases, Dr. Stocks described a new and simple statistical method of using the notification records of any infectious disease to elucidate the changes which take place in communal immunity. Hitherto it has been impossible to make more than a guess as to why certain children contract such diseases as whooping-cough or chicken-pox whilst others escape. The possibilities are inherent immunity, latent immunisation, or avoidance of infection, but there has been no evidence on the relative parts played by each of these factors. When compulsory notification of an infectious disease has been in force for some years in an area, and school records of contacts to cases of this and other diseases have also been kept, it should be possible in the future without employing any elaborate statistical processes to settle these points and thus to go far towards understanding the characteristic features of epidemics of different diseases and the most hopeful lines of preventive work. The method described by Dr. Stocks consists in (1) a study of the *index of apparent infectiousness*, which he explained in THE LANCET of April 12th, p. 786, and (2) a study of the *subsequent behaviour of contacts* over a period of years—compared with control groups of children not so intimately exposed to infection or immunisation. A simple application of the first method to the notification records of diphtheria in St. Pancras showed that, on the assumption that one-third of the children in the exposed population escape contact with infection, the proportion of those who are immunised by latent processes to those exhibiting clinical signs of the disease is approximately 5 to 1, a result which agrees with conclusions reached by Schick tests. A similar calculation for scarlet fever led at once to an equation between the proportion of children who retain an inherent immunity and the ratio of latent immunisations to clinical cases which was in close agreement with an equation deduced independently from records of Dick tests thus if one-quarter to one-third of the children born retain an immunity after their first year, as these tests suggest, the ratio of latent to clinical cases is three or four to one. Dr. Stocks applied the methods also to records of notified cases of whooping-cough, and contacts to them, in Wandsworth and Holborn; he arrived at the conclusion that in this disease latent immunisation is non-existent or of very little importance, and further that the great bulk of children who escape whooping-cough in urban areas do so by virtue of an inherent immunity rather than by avoiding contact with infection. With reference to chicken-pox, seven years of notification records in Paddington showed an inverse relation between the size of the mid-

summer and autumn epidemics; school closure for the summer holiday did not account for the cessation of epidemics in August and their recrudescence in October, which were characteristic features of the years under review. Analysis of notification records and of the after-histories of contacts suggested that a certain proportion, possibly a quarter to a third, of children born retain an inherent immunity to chicken-pox, and that latent immunisation protects others—possibly another quarter. The ratio of latent to clinical cases was not likely to be greater than about one to two, but Dr. Stocks considers it necessary to analyse more data before this can be asserted with confidence. The St. Pancras records of German measles when examined by the first method seemed to show that, as in measles, latent immunisation is a controlling factor, but further work was also required here. In submitting these preliminary results Dr. Stocks urged the importance of preserving the original notification records, especially of those diseases which are only notifiable in a few areas, for useful advances in our knowledge of the mechanism of epidemics might follow a proper statistical treatment of these records over a series of years.

A NEW AUSTRALIAN SCHOOL.

THE new School of Public Health and Tropical Medicine in Sydney, which is shown in the accompanying illustration, was opened on March 6th by the Hon. Frank Anstey, Minister for Health for the Commonwealth of Australia. It will carry on the work of the School of Tropical Medicine which has been in existence since 1907 at Townsville, and its inauguration follows a recommendation made by a Royal Commission of Health, which issued its report in January, 1926. The commission proposed that a chair of preventive medicine should be established with an adequate department of tropical hygiene, and that the University of Sydney should be selected for this purpose. It also recommended that a feature of the work should be a collection and condensation of the records of the medical administration of the Pacific Islands. The school is housed in its own building within the university grounds, close to the medical school. Erected at a cost of £35,000, it provides for departments of parasitology, entomology, bacteriology, pathology, and chemistry, whilst sections dealing with physiology, industrial hygiene, epidemiology, vital statistics and sanitary engineering are contemplated. The school will be under the control of a council composed of representatives of the Commonwealth Government and the University of Sydney. Dr. Harvey Sutton has been appointed director. It will provide especially for the post-graduate training of public health personnel, but will also include special non-medical courses of school hygiene in the diploma of education, and of tropical hygiene in the diploma of anthropology. The courses for the diploma in public health and for the diploma in tropical medicine have already been commenced, and a diploma of tropical hygiene is contemplated. A library to deal with public health and tropical medicine is being built up from a nucleus, previously existing at Townsville, which it is hoped will be complete in all Australian aspects.



School of Public Health and Tropical Medicine, University of Sydney.

REGISTER OF BIOPHYSICAL ASSISTANTS.

THE first register of biophysical assistants published by the Society of Apothecaries of London contains the names of 463 persons, arranged both alphabetically and topographically, who have been given a diploma by the Society. This first batch of diplomates have been admitted without examination, having offered satisfactory evidence of experience extending over two years in a hospital or three years in private practice in administering physicotherapy under medical supervision. The conditions under which the diploma is held involve an undertaking that biophysical assistants will not undertake the treatment of any patient except under the direction and control of a doctor, that they will not advertise in a professional sense except in the recognised medical and nursing papers, will not sell goods to patients in a professional capacity, or accept secret commissions on the sale of goods. Their diplomas are returnable to the Society of Apothecaries if these regulations are contravened. In the future, recruitment to the register will take place by examinations, of which the first is to be held next month. The course of training is to extend over 18 months, of which at least 12 months shall be occupied in clinical instruction. The syllabus for Part I. includes anatomy, physiology and physics, and for Part II. the theoretical principles concerned with electricity, the various types of current used in medicine, radiant heat, light therapy, and medical diathermy. Chartered masseurs and masseuses will be exempt from Part I., and members of the Chartered Society of Massage and Medical Gymnastics who hold the Society's certificates in medical electricity will be admitted to the register of biophysical assistants on signing the necessary undertaking and paying the required fee.

The establishment of the register arose out of a suggestion made to the Society of Apothecaries of London by a committee of the British Medical Association, following a resolution by the Representative Body, who were concerned for the protection of the public from the risks of physical treatment by untrained persons. The need for qualified technicians has become an urgent problem since the popularity of rays of different wave-lengths has reached and even overtaken that of electric currents. The

manipulation of radium and the adjustment of X ray apparatus have such obvious dangers that quite untrained persons are not, perhaps, likely to attempt these procedures. It is doubtless for this reason that the registration of technicians skilled in handling radium and X rays has been considered less urgent; moreover, the Society of Radiographers to some extent fills the need, since its members undertake to work only under medical supervision. To switch on lamps which emit rays, visible or invisible, on the other hand, seems a simple job, and many are tempted to assume that it calls for no special skill. The fact that the erythema caused by large doses of ultra-violet light does not appear at once, but is delayed for some hours, is an additional reason for demanding an experienced administrator. The Biophysical Advisory Committee who have compiled the regulations for the examination, include: The Master of the Society, Lieut.-Colonel C. T. Samman, Dr. J. D. Bailey, Dr. A. E. Barclay, Major-General D. J. Collins, Prof. W. E. Dixon, F.R.S., Sir William Hale-White, Dr. C. B. Heald, and Dr. F. D. Howitt. We have no doubt that practitioners will appreciate the convenience of knowing that members of the register have a sound grounding in electrical and light therapy, and will gladly employ them.

SCHOLARSHIPS FOR STUDENTS OF MENTAL HEALTH.

THE Child Guidance Council announces that by the generosity of the Commonwealth Fund it is able to offer six scholarships of about £181 each to students taking the Mental Health Course of the London School of Economics and Political Science (Department of Social Science and Administration). These scholarships are given in order to assist suitable candidates who would otherwise be unable to take the course, and in selection of candidates consideration will be given to their previous experience of social case work, and to the type of work which they wish to pursue after training. The scholarships are open to those wishing to undertake social work for children or adults at child guidance and hospital clinics, at mental hospitals, and in associations for the care of mental defectives. They are also open to hospital almoners, children's workers, and probation officers. The chief subjects of the course are psychology, psychiatry, and social case work, and it is held during the autumn session and the subsequent vacation. Further particulars may be had from the secretary of the council, 7, Buckingham Palace Gardens, S.W.1.

AN ITALIAN JOURNAL OF LABORATORY TECHNIQUE.

A NEW monthly periodical published in Naples is likely to prove a useful supplement to books on laboratory methods in this and other countries by putting on record the newest investigations. The journal is edited by Prof. Luigi D'Amato, of Naples, and the editorial committee contains, besides those of well-known clinical pathologists in Italy, the names of J. J. R. Macleod (Aberdeen) A. Castellani (London), and H. G. Wells (Chicago). The first issue, which is before us,[1] contains an article by Dr. G. Emanuel of Berlin, on the colloidal mastic test in the diagnosis of neuro-lues. This test, which is of easy technique, is regarded as useful in the differential diagnosis of the various morbid types. In an article by Dr. L. Cattaneo of Pavia, the author proposes a modification of Hackenthal's method for the discovery of cow-pox virus in the blood. He centrifuges the blood made incoagulable by means of heparin, decants the plasma, adds a few drops of extract of fresh organs to the sediment, leaves it for an hour at a temperature of 37°C. and takes off the thin film which forms on the surface of the clot. The virus is found in large quantity in this thin pellicle of leucocytes and platelets. Prof. A. Lustig of Florence contributes a review on the analogies between the bacilli of undulant fever and contagious abortion. He discusses the work done at the institute of general pathology in Florence, and agrees with Favilli that the components of the genus brucella are different types of the same germ and that the bacillus of Bang, generally not pathogenic for man, may at times become so, and assume characteristics absolutely identical with those of *B. melitensis*. Prof. G. Sollazzo of Milan describes the use of phenol-alcohol in the Wassermann reaction and pleads for more extensive observations on the method of Ninni and Molinari. There are editorial articles on Kolmer's reaction and ultra-filters, and summaries of medical literature arranged under classified headings. The longer articles have been resumed in Italian, English, French, and German.

[1] Diagnostica e tecnica di laboratorio. Rivista mensile. Vol. I., No. 1. January, 1930.

VIRUS DISEASES AT THE ROYAL SOCIETY.

THERE were two exhibits at the Royal Society's conversazione at Burlington House on May 14th which were of unusual interest to medical visitors. Both dealt with virus diseases. Mr. S. R. Douglas and Miss J. Marchal, from the National Institute for Medical Research, showed a number of naked-eye and microscopical specimens illustrating a new disease they have found in mice. It was originally recognised by observing that certain stocks of laboratory mice were particularly liable to a swelling of one hind foot followed by gangrene and loss of the end of the leg. Attempts to transmit the infection by bacteria cultivated from the lesions were unsuccessful, but if an affected foot was mashed up and filtered through a porcelain bacteria-proof filter the disease could be readily transferred from one mouse to another by inoculation of the filtrate. It was afterwards found that the disease was more widespread than the gangrenous lesions suggested; mice may suffer and die from it without losing a foot, the constant lesions in all animals being necrosis of liver and spleen. This implies that the name of "infectious ectromelia" chosen by the discoverers is not altogether happy, and in any case "ectromelia" is normally applied to a congenital defect rather than an acquired condition. Would it not be better to avoid the pitfall of a definitive name altogether and call it simply "Marchal's disease"? Another striking feature is the number and size of the "inclusion bodies" which occur in the cytoplasm of epithelial cells in the skin, pancreas, and salivary glands, occasionally also in connective tissue. In some of the sections shown they were so large and formed such a large proportion of the tissue that it looked as if their extraction and analysis ought to be possible.

The other exhibit dealt with plant viruses, particularly tomato mosaic, and came from the Rothamsted Experimental Station under the charge of Dr. J. Henderson Smith. Two points in particular were illustrated, of which the most strikingly objective was again the characteristic inclusive bodies as they develop in the epidermal hairs on the leaf. They here reach such a large size that they are easily seen with the low power of the microscope, and their growth and evolution may be precisely followed. In their early stages they are made up of amorphous granules, but later on there is distinct evidence of the separation of protein crystals. It is not supposed that the bodies actually are the virus, but that the virus upsets the colloidal equilibrium of the cell contents with the separation and finally crystallisation of some of the protein contents. Other specimens illustrated the fact that virus will not pass from one part of a tomato plant to another through a length of stem which had been killed, though water and such dyes as eosin readily do so. There is, in fact, no evidence that the movement of virus within a plant takes place in the water or transpiration stream. This raises something of a mystery, for in general any infected plant contains the virus throughout and it spreads quite quickly

from the locus of an artificial inoculation. Those who are inclined for further information will find a useful survey by Dr. Henderson Smith in the current number of *Biological Reviews*.

LEAGUE OF NATIONS HEALTH COMMITTEE.

AT the recent session of the council of the League of Nations the Health Committee of the League was reconstituted for a period of three years from July 1st. The new members of the Health Committee appointed by the council after consultation with the outgoing committee include Dame Janet Campbell, Senior Medical Officer for Maternity and Child Welfare, Ministry of Health, who is chairman of the committee of health experts on infant welfare of the Health Organisation of the League. Sir George Buchanan, Senior Medical Officer, Ministry of Health, has been reappointed a member of the Health Committee on the nomination of the governing body of the Office International d'Hygiène publique in Paris.

POLLUTED STREAMS.

THE report[1] of the Water Pollution Research Board for the year ended last June is not so much a record of progress as evidence of coöperation between industry and the administrative authorities. The report points out that water for industrial purposes is often spoilt for industry by industry and that the growing population needs more and more to have recourse to rivers for domestic supplies. If we use the headwaters of a river for drinking purposes and if our factories use water from the lower reaches for industrial purposes, in each case we ought to return the effluent in such condition as to allow of a successful process of self-purification by the river. There is last but not least the æsthetic point of view. What a transformation in the countryside would be effected if all our streams and rivers were clean and fit to support fish-life. Further, we cannot cultivate respect for a stream which is used as a sewer or a conduit for unpurified trade effluents, or greatly blame those who throw litter or refuse into it. In recent years new processes dealing with artificial silk and the waste from milk and beet sugarfactories have added to the problem, but science has not even solved the difficulties of sewage effluents and the waste waters from collieries and gasworks. Since its formation in 1927 the Board has coöperated in research with managers of sewage disposal works, the institution of gas engineers, the beet sugar factories' committee of Great Britain, and a committee of the Royal Sanitary Institute. The Tees may be taken as typical of a polluted river flowing through an industrial area, and a comprehensive biological, chemical, and hydrographical survey of this river has been undertaken by the Board. A summary of existing knowledge on the base-exchange or zeolite process of water softening has been issued, and further investigations are in progress from the physico-chemical point of view at the chemical research laboratory at Teddington and from the bacteriological point of view by Sir Alexander Houston. An investigation of the activated sludge process is being conducted by Prof. W. W. C. Topley at the London School of Hygiene. Another matter receiving attention is the gauging of rivers and streams for the purpose of obtaining exact knowledge of the flow of rivers and the effects of tidal flows. The special report of the Director of Research, Dr. H. T. Calvert, deals largely with beet sugar factories. He describes the operations at such a factory, which if it handles 1000 tons of beet may use three to four million gallons of water per day. Work at the experimental plant, Colwick, facilities for which were provided by the Anglo-Scottish Beet Sugar Corporation, Ltd., has already given hopes of so treating the waste waters that they may be re-used in the various operations.

[1] Obtainable from H.M. Stationery Office. A complete list showing prices may be had on application to the Department of Scientific and Industrial Research, 16, Old Queen-street, London, S.W.1.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles Contributed by Invitation.

LXXIV.

THE SIGNIFICANCE OF IDIOPATHIC SKIN REACTIONS.

PART II.*

WHAT DISEASES TO TEST FOR.

IN Part I. of this article it was made clear that we can produce a long list of symptoms by applying grass pollen to the hay-fever subject in various ways. From another point of view, it is useful to consider what disorders can be tested for by skin reactions. The list includes :—

1. *Conjunctivitis:* the sufferer is sensitive to some foreign protein substance in the atmospheric dust.
2. *Paroxysmal rhinorrhœa*, or *vasomotor rhinitis* (of which hay-fever is but an example). The mucous membrane or, as the case may be, the modified epithelium of the respiratory passages is sensitive to, and therefore reacts to, some foreign protein particles in the inbreathed air; possibly the irritant may be circulating in the blood.
3. *Asthma:* the foreign protein is either in the inspired air or, more probably, is circulating in the blood—a toxæmia in fact. It may be difficulty to guess what are the irritants in question.
4. *Urticaria, eczema, ichthyosis*, or any mixture of or intermediate stages between these three; the poison is probably circulating in the blood, but it may have gained adventitious entrance to the skin—e.g., by a prick or midge-bite.
5. *Angioneurotic œdema*, which is a subcutaneous accentuation of urticaria.
6. *Functional albuminuria*, which is a serous exudation or urticaria of the kidney: if this disorder arises from a protein sensitisation the protein must arrive as a toxæmia.
7. *Paroxysmal hydrarthrosis*, which is a similar serous effusion into a joint.
8. *Migraine*, if from the history of the case or the familial history it is suspected that some foreign substance is causing the trouble through a sensitisation: if a sensitisation is suspected it must be to a toxæmia.
9. *Epilepsy*, if a sensitisation is suspected; a toxæmia.
10. *Food idiosyncrasy*—i.e., nausea, vomiting, and diarrhœa as a local reaction to the food itself: the irritant is clearly some ingredient in the ingested food.
11. *Dysenteric symptoms, tenesmus*, possibly such conditions as *cyclic vomiting*, may be due to a sensitisation: the irritant is not necessarily a foodstuff; more probably it is bacterial, or some product of digestion, and it may, of course, be present as a toxæmia.

It is noteworthy that the sensitisation of the patient to a foreign protein may give rise to a number of these disorders simultaneously; or these disorders may alternate or change from one to another—e.g., first migraine, then asthma, then urticaria, then back to migraine. Or the eczema which a child suffers from in babyhood may change to asthma after whooping-cough or pneumonia. In such a case one is searching for the ætiological agent for several "diseases" at once. Also (and this leads to much complication of testing) there may be with one patient a number, often a large number, of foreign substances each capable of producing any of these disorders.

The "Protein Irritant": Allergens.

The substance to which the sufferer is hypothetically sensitive has been spoken of as the "foreign protein"; this terminology may be questioned, since occasionally patients are demonstrably sensitive to such substances as morphine—or even such chemically simple substances as potassium iodide (see below). Another objection is that the active agent may not be a protein, but a much simpler substance, perhaps attached

* Part I. appeared last week.

to the protein molecule, which causes the disorder and also causes the skin reaction. This may be so, but since the reacting substance (in pollen or horse dandruff or fish myoplasm) will not go through a dialysing membrane, it seems justifiable when dealing with immunity phenomena to speak of them as protein substances. Making use of von Pirquet's term "allergy" which he coined for his tuberculin reaction, it has been the custom, especially in America, to label all the toxic idiopathies, all the diseases of the asthma group, as "allergy" or "allergic phenomena," although there seems to be an inherent difference between asthma, for example, and tuberculosis in the mechanism of the skin tests. If we accept this extension of the meaning, then the reacting substance, causing the disorder or the skin reaction may aptly be called the "allergen."

What Substances may Function as Allergens.

An infinity of substances may cause the asthma group phenomena—any particular animal or vegetable protein (including all the unclassified moulds and bacteria), or any product of any of these proteins when denatured by heat or chemicals. Even our own tissues when denatured by trauma or chemicals such as morphine or potassium iodide are capable of acting as the "foreign protein." This gives an impossibly unwieldly list and means that skin tests must be embarked on with discriminating intelligence; they should never be ordered at random by the physician or carried out blindly by the pathologist. Experience shows us that random tests seldom give much help because of the difficulty of knowing what to suspect.

Another great difficulty is that these allergens do not react equally on the skin; one type, grass pollen, is unusually good, so are the scurfs of animals—e.g., horse. Food substances are weaker in their action; and that important group, the fungi, including all the pathogenic bacteria and the enormous numbers of unclassified moulds, not only tend to give indeterminate reactions, but also delayed reactions (comparable to Pirquet's tuberculin reaction).

The useful application of skin tests, if we exclude those which are merely confirming a diagnosis brought by the patient, depends largely on whether we can pick up useful hints about possible allergens from a questionaire.

What Proteins Should we Test: A Questionaire.

Before deciding what skin tests to make, or even if such tests are worth making, the patient should be closely cross-questioned with allergens in view. The following suggested questions are not universally applicable—one cannot, for example, reasonably ask at what hour an attack of eczema started. Also, these patients are so suggestible that it is better to reach, say, the "horsehair mattress" indirectly. It is amusing to hear a woman explain that a feather pillow instantly gives her asthma when she is at that moment lolling on sofa cushions from which a few small white feathers are protruding.

How long has the patient had the disorder, continuously or off and on? What seasons of the year are worst, what are the least troublesome?

On what days of the week are the attacks worst? Very often patients will incriminate the week-ends—an interesting point, though it is not always easy to see its bearing.

At what hours are the attacks worst, or when do they usually start? The answer is often: "Usually at night, and very frequently at 6 A.M. or when I begin to get up." This answer bears on the psychological factor in asthma, &c.; it is only significant for us here as showing indirectly that the proteins of food are playing little or no causal part in the illness.

Does food affect them? The evidence is slight or overwhelming. Usually, food does not affect them as a *specific protein*, though they have probably been told that it does. Food affects the asthmatic, &c., in at least four ways: (1) By introducing proteins to which the patient is sensitive (reaction in 20 minutes to 1 hour). (2) By causing bacterial fermentation in the gut; to these bacteria the patient may be sensitive (reaction in 24 hours approximately). They will probably blame "rich" food and sugar. (3) By overloading the stomach and thus setting up disturbing nerve reactions (½ hour to 6 hours). (4) By suggestion, through remarks they have heard from others (reaction in any time, according to gossip, but usually within half an hour). The first of these is the one most talked about but is the least frequent; it alone can give positive skin reactions to specific food proteins.

What preceded the first attack? Bacterial sepsis is often implicated here, and anyway should be studied as carefully as the septic foci in a rheumatism case are investigated—how any suspected cultures are to be used will be described later.

Do places make a difference? Here one must guide the patient in discriminating between different localities and different houses or even rooms. The presence of mould spores in the dust of rooms is an important point. They had better be tested for by means of an extract made from the dust—to be described later. Trouble from the water-supply must be kept in mind, and if necessary, an extract made.

What are the home and what are the work-place surroundings? Does the patient see much of animals, birds, or horses? Does he work in a dusty atmosphere—e.g., flour or sawdust?

What is the toxic idiopathic history of this patient and of his blood relations? A line on probable directions for investigation may often be gained from this inquiry; one of a group of these diseases tends to run in a family.

How to Obtain Protein Reagents for Testing.

Reagents should approximate as closely as possible (chemically speaking) to the protein irritant suspected of causing the trouble; if practicable they should be the identical substance. Thus, if a man is egg sensitive a trace of white of egg will serve for the testing; hay-fever can be detected through any grass pollen; the pollen of any suspected flower can be dusted on to a scratch on the forearm, but any such sensitisation is merely accessory to true hay-fever and comparatively unimportant. An animal sensitisation can be diagnosed by means of a few hairs from the animal. A set of protein reagents, if they have been much "prepared" may easily have become denatured and so give only a poor reaction or none at all. I myself have failed to get reactions on horse asthma patients with the horse dandruff reagent supplied by several first-class firms, but have got it at once on getting some fresh curry combings from the nearest stable. It is, therefore, suggested that the practitioner should examine his case first by some such questionaire as is given above and make a list of the proteins he wishes to test; he should postpone the actual testing till the next session. He will probably be able to extemporise from his kitchen or his garden the substances he requires. If necessary, the juice of a vegetable or of plasma from meat or fish can be expressed, but as a rule the unaltered material will do perfectly well. Such material as animal scurf and animal hairs can be used unaltered, or if preferred an extract can be made in normal saline and 0·03 per cent. sodium carbonate. The best way of sterilising such extracts or fluids is to put them through bacterial filters; but heavy centrifugalising will remove solid particles.

If this is deemed unprofessional or if a diagnosis has to be attempted out of hand, then recourse must be had to the sets of proteins on the market, and there are several to choose from. Or the practitioner may wish to make his own supply—particularly where, as with grass pollen, the material cannot be obtained all the year round.

There is one alleged advantage of the sets of reagents—one may have a group test—i.e., a mixture of all the members of the group: thus, a fish group, a nut group, a shell-fish group, an animal hair group, a stone-fruit group, a meat group, and so on. But if a single protein may fail to react if too much prepared, then still more easily may a single ingredient in a group mixture fail. Besides, preliminary testing with group reagents means blindfold testing—which should never be necessary, and is of doubtful utility. The home-made reagent is the best.

I spoke in a preceding section of cultures of bacteria, suspected of causing trouble by sensitisation. Though these are to be had in the sets of reagents, it is clearly

better to work with the patient's own cultures. A thick emulsion of the bacteria should be allowed to autolyse so far as they will, and then be centrifuged heavily to get rid of solid particles. I also spoke of dust, particularly fine house dust from the top of cupboards; this should be extracted in saline with a trace of sodium carbonate in it (0·03 per cent.). After extraction in the ice-chest for several days it should be put through a bacterial filter. Drinking water may be evaporated down at 45° C. under a vacuum. When it is reduced to a small bulk the concentrated salts are dialysed out.

If the particular protein is quite new to the investigator it would be wise to make a test on a normal skin (e.g., on his own) to make sure that the substance is not a universal irritant.

Routine Technique for Skin Tests.

A convenient site for testing is the flexor surface of the forearm; but if there is to be any scarring then the upper surface of the thigh, just above the knee, is preferable for women and convenient for children. Preliminary cleansing of the skin is probably quite unnecessary, but if thought desirable soap and water are the best.

A number of small areas, say 3 mm. in diameter, are scratched through the skin till the pink cutis vera is laid bare but without the drawing of blood. One such scratched area should be reserved as the control. Onto the other areas the various protein reagents are placed and gently rubbed in with a small glass rod or the wrong end of a wooden match in order to make intimate contact between the foreign protein and the living cells of the skin. After a minute or two any debris or blood can be cleared off the scratched areas with saline and cotton-wool so that the wealing, &c., can be clearly observed. A reaction will be precisely like that described above for hay-fever. It will begin in 7 minutes, and be fading in 20 minutes, reaching its height in 10 to 15 minutes. A positive reaction should show an urticarial weal not only over the scratched area, but extending beyond this with irregular edges; round the weal will develop the erythematous blush. This may be a scarcely perceptible pink rim round the weal or may extend beyond it for 2 or more inches; in any event, to be positive both must be definitely bigger than anything appearing on the control site. Such a method as this is very convenient for the rubbing on of solid substances, such as a piece of Brazil nut or a piece of carrot, and it can quite easily be used for fluids—e.g., cow's milk or horse's serum—it is, in fact, universally applicable.

Another method is to place a drop of fluid containing the test protein onto the skin and then to prick with a sharp needle through the drop vertically into the skin, only puncturing the skin to the depth of half to one millimetre. This puncture injects a minimal quantity intradermally, and is easy to make comparable from protein to protein and from day to day. For purposes of record it is convenient to trace on an ordinary microscope slide the central prick, the weal, and the surrounding erythema, or such of it as will go on to a slide. (If a wash of dilute egg white is smeared over the slide and allowed to dry this will facilitate the inking-in but is hardly necessary.) With this prick method a control prick should always be made through saline, and any reaction judged to be positive must be definitely larger both in the weal and in the erythema than anything shown round the control prick.

A special word must be said of extracts prepared from bacteria, moulds, or other fungi—frequently a dust extract comes under this head. These reactions are rather indefinite and tend to be delayed; sometimes they are at the height of their reaction an hour or two afterwards and sometimes even next day. Indeed, the condition begins to approximate to a von Pirquet reaction. It cannot be denied that it is a great disadvantage that two such important groups as the bacteria and the moulds give such comparatively unsatisfactory reactions. Perhaps it is better with them to make a filtered extract and then an intradermal injection can be given.

Conclusion.

If the application of a protein reagent produces no reaction this may mean that the preparation used for the test (1) does not tally quite with the protein suspected as the cause of the disease—it may, for instance, have got denatured in the process of preparation; (2) it may be of a type (e.g., bacteria) which at best only gives a poor reaction; or (3) the failure may really mean that the patient is not sensitive to that particular substance.

If the reagent produces a definite reaction under suitable controls then the patient is sensitive to that particular reagent. But this sensitisation may not be causing *all* the mischief—or, indeed, any part of it. For example, a man who has been careful to avoid lobsters for years will not think one has got to the bottom of his trouble if the flesh of one gives a positive reaction, and he is merely told to avoid them in future. However many positive reactions one may get it is always possible that the chief "asthmatic" factor has not yet been detected; in fact, any degree of confidence on this point can only be gained by a really painstaking questionaire as detailed in a previous paragraph.

Any positive skin reactions must have this significance at any rate; a patient's tendency to react puts him definitely into the sensitisation class and he is a candidate for all or any of the toxic idiopathies—even if the causal protein irritant has not yet been detected.

JOHN FREEMAN, D.M., B.Ch. Oxf.,
Director of the Department of Clinical Bacteriology, St. Mary's Hospital.

The Services.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub-Lt. J. D. J. Freeman to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. G. H. J. Brown, having attained the age for compulsory retirement, is placed on retd. pay.

Maj. and Bt. Lt.-Col. (temp. Lt.-Col.) F. A. McCammon to be Lt.-Col., vice Lt.-Col. G. H. J. Brown.

Maj. and Bt. Lt.-Col. R. E. U. Newman to be temp. Lt.-Col.

Maj. R. B. Myles retires, receiving a gratuity.

The undermentioned Capts. to be Majs. (substituted notifications): E. Percival, R. D. Cameron, H. M. Alexander, A. G. Harsant, J. K. Holland, and M. C. Paterson.

The undermentioned Lts. (on prob.) are confirmed in their rank: G. F. Harrison, A. N. T. Meneces, E. F. Curran, and F. R. Gedye.

ARMY DENTAL CORPS.

Capt. B. E. Gentleman to be Maj.

ARMY RESERVE OF OFFICERS.

Lt.-Col. J. H. Fletcher to be Lt.-Col.

MILITIA.

Majs. J. A. Pridham and T. Warrington relinquish their commns. and retain the rank of Maj.

TERRITORIAL ARMY.

Lt. J. S. M. Connell to be Capt.

D. L. Cran (late Cadet Corpl., Manchester Univ. Contgt., Sen. Div., O.T.C.), to be Lt.

Lt. A. McDowall to be Capt.

ROYAL AIR FORCE.

Flying Officer F. G. Mogg is granted a commission in the Special Reserve on resignation of his commn. in Class D.D.

Flight Lt. J. B. Woodrow relinquishes his commn. on completion of service.

DEATHS IN THE SERVICES.

Col. Charles John O'Gorman, D.S.O., R.A.M.C., who received his medical education at the Catholic University of Dublin, and was late senior house surgeon at the Mater Misericordiæ Hospital, died at a nursing home in Dublin on May 11th in his fifty-eighth year. He entered the Royal Army Medical Corps in 1898, and served in the South African War of 1899–1902, where he was at the defence of Kimberley and in operations in the Orange Free State and in Cape Colony (twice mentioned in despatches, Queen's Medal with three clasps, King's Medal with two clasps, and the D.S.O.). During this period he was promoted to captain—namely, in 1901, to major in 1910, and to Lt.-Col. in 1915. In the late war he served as an assistant director of the medical services.

Special Articles.

"ON SIGNING YOUR NAME."

A Clinical Lecture delivered at Guy's Hospital on May 19th, 1930,

BY T. B. LAYTON, D.S.O., M.S. LOND., F.R.C.S. ENG.,

THROAT AND EAR SURGEON TO GUY'S HOSPITAL; CHAIRMAN OF THE LONDON INSURANCE COMMITTEE.

As members of the medical profession we often have to sign our names to documents which appear at first to be of small importance but which may under certain circumstances have far-reaching effects. These documents fall under two heads, those which are signed by us as a part of our medical work and which contain some professional opinion, and those which we sign because the right or privilege has been given to us by the nation or otherwise as a mark of the confidence in which we are held. This power to sign our name should be held by us to be a sacred duty that we should at all times carry out with all the care that is within our power, and I want to discuss with you to-day some principles that should guide us in doing this duty.

Carelessness and Neglect.

I may start by giving two examples that have come within my experience where there has been a failure to perform it, in the one due to gross carelessness, and in the other to criminal neglect.

CASE 1.—Some 22 years ago I was a medical officer in a large poor-law infirmary, and one day did a round for a colleague off duty. As I finished the sister said: "There is Daddy Twenty's pension paper to sign." I looked at it and said, "Where is his discharge certificate?" Although the patient had been under her charge for over two years, the sister had never heard of this. Each week the doctor had signed the paper without seeing this document, although by his signature he said that he had that day seen the certificate and the pensioner, and that he believed him to be the person described thereon. The sister was a bit indignant that I would not sign. The young woman who had come to fetch it was more so, saying she wanted the money that day, and had to return to work by 2 o'clock. I pointed out that it was then 12, that she had plenty of time to go home and fetch the document, and that if she wanted the money so badly it was worth this effort to obtain it. She went away, and no question of a pension to be drawn by that patient was ever raised again.

I have but little doubt that certain persons had been causing this old man to impersonate some dead pensioner over a period of two years or more. This could only have been rendered possible by the false certificate signed weekly by my friend.

CASE 2.—At Christmastime, 1916, I was the senior medical officer of a small detached force of 7000 men in Northern Greece. The O.C. the R.E. Coy. came to me saying that as things were quiet it would be a convenient time to get his men inoculated. I was surprised that he had any appreciable number of men uninoculated, for we had left England but six months; and great efforts had been made to get everyone in the division injected before we left. I, therefore, sent a sergeant over to his orderly room to examine the pay-books of his men. In the last page of this a medical officer entered every inoculation as he did it, dating and initialing his entry. My sergeant brought back a report that all the pay-books were entered up as though the men had been inoculated immediately before we had left this country. I told the O.C. this, and he then informed me he had reason to believe that all these entries were false. He had only taken over the command a day or so before we had left, but he had learnt that actually hardly any of the men had been done. We inquired further of the N.C.O.'s of the Company, and learnt that the M.O. in charge had let time so slip by that there were no longer the necessary number of days before embarkation for the inoculation to be done, and that, finding himself in this fix, he had made entries in all their pay-books as though he had inoculated them, whereas in fact he had only done two or three. This officer was not with our small force, but he was still with the Division some 100 miles away, and I reported the matter to the A.D.M.S., saying that I thought there was no doubt there was evidence enough to obtain a conviction on court-martial. I was informed that no action would be taken, that the Divisional Commander did not want a scandal in the Division, especially in reference to an officer of the R.A.M.C., for fear it would weaken the confidence in which the medical officers were held.

Let me at the outset lay stress upon the different view the doctor and the layman takes in these matters. I think we should all agree that the second of these two cases was the more serious. That the medical officer there had no sense whatever of professional honour when he definitely endangered these men's lives by making false entries in their pay-books to cover his own slackness. Yet here was a Divisional Commander, himself the very soul of honour, who would take no action in the matter. This was not weakness on his part; he was ruthless in following up any suspicion of neglect of a sick or wounded man on the part of any member of the R.A.M.C. I have no doubt he would have taken a most serious view of Case 1, and in this he would have the support of every lawyer, financier, or administrator who would feel that the very system upon which our complicated finance is based was being undermined by the doctor's neglect. Understand that it is impossible to defend that action to laymen or even to plead mitigation of the offence.

Pressure from Without.

In neither of these cases was there any pressure from without, yet in many there is and the doctor places his signature against his better judgment. Such pressure may be a fear of social opprobrium or of financial loss. To give in to it is weakness, a weakness with which we may condole, but which we must not condone, for when it brings its owner in trouble and he is faced with his signature on the document anything said in extenuation appears but as a specious argument.

CASE 3.—One evening a neighbour dropped in upon a doctor, asking him to sign a passport paper for her brother-in-law. He replied that he would be delighted but, on looking at the document, added that he could not, as it stated that he knew the applicant personally. The lady indignantly suggested that surely he could trust her, adding that if he did not sign they could not go on their trip, as the paper must go in next morning and there was no time to get any other eligible person to sign. The doctor's wife supported her, not wishing to have any unpleasantness in a new neighbourhood to which they had recently moved.

I am glad to say I know of no case of improper signing of a passport paper by a doctor; but this case shows the pressure that may be put up by unthinking people, who have no idea that they are doing dishonourable deeds. Such pressure must always be resisted. The right to sign a passport paper is one of the things that puts us above the common herd. It is the recognition by the State that the code under which we live and work is a higher one than the average of the community.

CASE 4.—A doctor working at the Ministry of Pensions was asked by the head clerk to sign his paper for a weekly pension. He looked at it, and pointed out that the signature involved his saying he had that day seen the pensioner's children alive. In an unpleasant tone the clerk said, "The children are at school, I can't bring them here." The doctor suggested he could between 12.30 and 2, and offered to wait during that period to see them. In a huff the clerk removed the paper, saying, "I can easily get someone else to sign it. I have never been asked to bring the children before." For several weeks after this the number of sessions that the doctor was called up for attendance at the boards showed a diminution.

The importance of this case shows that there must be a number of medical men prepared to sign a document without reading it or else without a due appreciation of their responsibility when signing. This clerk had been drawing his pension for over two years and apparently he had no difficulty in getting some medical man every week to sign a false statement on his pension paper. The men working there were all from the consultant branch of the profession.

There is another very common reason given for asking a doctor to sign a certificate wrongly. It is that unless he does so some poor person cannot draw the weekly money and the invalid, his wife and child must go starving without it. Against such suggestion you must rigidly set your face. Either the regulations for drawing the money are bad and should be amended, or the person bringing the certificate for signature has let time slip by, so that he or she is faced with the difficulty out of which you are asked to get him. In neither case is there any reason why you should put your signature to a false statement and risk the whole of your career thereby. Let there be no doubt about this. When you are faced with that document and its misstatement no arguments about doing it out of kindness to the sick will protect you. The case is bound to go against you and no one can save you.

If you are brought up before the General Medical Council you are liable to be struck off the rolls. If the case comes up in a civil or other court you will break down in cross-examination; and if it is a case under the National Insurance Act you will, as we shall see later, get into serious trouble.

Signing an Unfinished Document.

In association with this never sign a form in blank and leave it for someone else to fill in. Some years ago, as we were going out of the ward, the sister asked my house surgeon to leave her some certificates and he turned round and signed in blank some half a dozen that she had ready for him. I was aghast at this and spoke most severely to both. The sister produced the usual arguments. That the house officer was out during the visiting hours when the relatives asked for the certificates and they, poor things, would have to come up again if these were not ready. I pointed out to her that with a little forethought on her or the patient's part the certificates could be got ready for the house surgeon to sign on his morning round. Then her arguments changed. Surely I could trust her to fill them in properly. This is a most dreadful argument to put forward. It is so difficult for a young man to controvert, especially when morning and evening he has to go round with the woman who puts it forward. The answer, of course, is that to sign a blank certificate is the same as signing a blank cheque for that, in effect, is what it is, the only difference being that it is a cheque on someone else's money. A house surgeon who gave the sister of his ward half a dozen blank cheques would be looked upon as a fool, but it is only his own money that can be drawn on them; to do so with documents on which someone can draw another person's money does not far remove him from being a knave.

Nor can any sister who is an accessory to this practice be considered free from blame. I do not know whether the General Nursing Council has any disciplinary control in the way our Council have; but in the event of such a certificate causing the doctor to be brought before the Medical Council the member of the nursing profession should be brought before her council. It should be considered as "infamous conduct in a professional respect" for a nurse to use her position in relation to a patient to influence the doctor treating that patient to do anything that can be so considered in respect to his profession. To my mind the only thing to do is to refuse ever to sign any document, even an admission slip to the hospital, unless and until it is completely filled in. You will thereby educate yourself not to sign any document till you have read it; and it will soon be known that it is useless to put an unfinished document before you and people will cease to do so.

A few days after I found the sister of my ward asking for blank signatures from my house surgeon I saw the physician in Clinical sign such a form and leave it for the clinical assistant to fill in. I remonstrated with him and he responded with the same high sounding rhetorical question: "Do you mean to infer I cannot trust Mr. X?" He failed to see that he was educating Mr. X in slipshod ways which he would carry out into the world with him. Your teachers are so busy trying to instil into you pathology and diagnosis with some smattering of treatment that they omit to teach you anything about the conduct of practice.

I find that leading members of our profession are not particular enough upon these points. They seem to think it undignified to do anything that they do not consider to be real medicine, and under this they do not include the signing of a document. Yet if they teach you nothing of the conduct of practice they should at least abstain from educating you by example in bad methods.

Do not for a moment think that these same physicians and surgeons will defend you when having risen to the top of the profession they come to sit upon the General Medical Council. They will not; nor if they would, can they protect you from the consequences of your action if you are brought before them with a certificate signed by you, the falsity of which has been proven before them. The Council has made this quite clear in the Warning Notice which they have issued to the profession and which contains the following:—

> Registered medical practitioners are in certain cases bound by law to give, or may be from time to time called upon or requested to give, certificates, notifications, reports, and other documents of a kindred character, signed by them in their professional capacity, for subsequent use either in Courts of Justice or for administrative purposes. (Here follows a list of documents, &c.) Any registered practitioner who shall be shown to have signed or given under his name and authority any such certificate, notification, report, or document of a kindred character, which is untrue, misleading, or improper, whether relating to the several matters above specified or otherwise, is liable to have his name erased from the Medical Register.

Certification for National Insurance.

Of the documents in this list, the most numerous, and from the national point of view, probably the most important, are those "under the National Insurance Acts and the Regulations made thereunder." Many, and perhaps most, of you will spend your lives by taking service under these Acts, and under Your Terms of Service you will agree to take on certain duties in the way of signing certificates. In the complicated state of our society we cannot exist side by side without the use of forms and documents; and upon the confidence that can be put in them must depend to some extent the stability of our social order. But I hope to show that a meticulous accuracy in such matters is nowadays also necessary for the proper treatment of our patients and is, therefore, as essential a part of medicine as is the ordering of an appliance or the writing of a prescription.

In the certificates that you will have to sign under this service there are two parts. The first involves a statement of fact, the second involves your medical opinion. The statement of fact which is included in every certificate is that you have that day examined the patient, and you have no right under any circumstances to sign this statement if you have not seen the patient on that day. Let us consider some cases which have been considered by the London Insurance Committee and where a doctor has done so.

CASE 5 (M. 29/11).—The facts of the case are as follows: The insured person was admitted to a hospital on Jan. 4th, 1929, and the society were furnished with a certificate of admission issued on that day. Certificates on Form Med. 40 were furnished, however, by the practitioner on Jan. 11th, 18th, and 25th, and each of those certificates indicated that the insured person had been examined by the practitioner on the dates appended respectively thereto. The first of this series of certificates—i.e., that dated Jan. 11th—contained a note made by the practitioner to the effect that the patient was in hospital.

CASE 6 (M. 29/21).—From the statements submitted to us by the society and the practitioner, we find the following facts to have been established: The insured person was first certified by the practitioner to be incapable of work on Dec. 11th, 1928, a First Certificate having been issued on that day indicating that the patient had been duly examined

on the date appended to the certificate and found to be incapable of work by reason of appendicitis. She was admitted to a hospital on Dec. 13th, 1928, and was discharged thereform on Jan. 10th, 1929. Intermediate Certificates were issued by the practitioner on Dec. 18th and on Dec. 24th, and in each of those certificates the practitioner certified that he had examined the insured person on the dates appended respectively to the certificates and found her to be incapable of work by reason of appendicitis. In the space for remarks, however, the practitioner indicated that the patient was in hospital. An Intermediate Convalescent Certificate (Form Med. 40 C) was issued by the practitioner on Jan. 12th, 1929, stating that he had examined the insured person on that day and found her to be incapable of work by reason of appendicectomy. A further Intermediate Convalescent Certificate was issued on Jan. 26th, 1929. The insured person went to Eastbourne on Saturday, Jan. 12th, 1929, and remained there until Sunday, Feb. 10th, 1929, and a Final Certificate, dated Feb. 12th, 1929, was duly issued by the practitioner.

CASE 7 (M. 30/13).—We find the following facts to have been established: The insured person was seen by the practitioner on Nov. 27th, 1929, and on Dec. 2nd, when the next consultation took place, he was given a First Certificate, written on Form Med. 40, stating that he was incapacitated for work by reason of gastritis. The practitioner, on information furnished to him by the insured person's wife, gave further certificates on Dec. 4th, 11th, and 18th, stating that he had examined the patient on the dates appended respectively to the certificates and had found him to be incapable of work.

The practitioner, in his written observations, stated that when he first saw the insured person on Nov. 27th he advised him, having regard to his (the insured's person) condition, to refrain from work, but the patient preferred to allow the matter to remain in abeyance for a few days. On Dec. 2nd the patient asked for a certificate, and the practitioner then gave him a First Certificate in respect of the examination on Nov. 27th. . . . . The patient's wife reported from time to time the progress of the case, and as this appeared to be satisfactory the practitioner issued the further certificates, his object being, as he informed us, to avoid any delay in the payment of benefit. He expected that the patient would attend at the surgery, and for this reason he did not put the case on his list for a visit. The practitioner added that during the routine of work he overlooked the fact that the patient did not present himself at the surgery. The practitioner expressed his regret for his laxity in the case, and undertook to be more careful in the future.

In all these cases the plea was put forward that the doctor had signed this statement in order to enable the patient to obtain the sickness benefit. Now it cannot be too clearly stated that the administration of sickness benefit is not the business of the medical profession. If there is anything wrong it is the business of the approved societies and the Ministry of Health to put it right. The medical profession is very insistent that the societies should not interfere with the professional aspects of the work; and you must play the game by not interfering with theirs.

Risk of being Party to Fraud.

It is right to be kind-hearted to your patients; but it is weakness of character rather than kindness of heart that leads you to sign a misstatement at the expense of your own career as well as at the risk of being a party to a fraud. That you are in danger of the last is shown by the following case.

CASE 8 (M. 27/1).—It appears that the case had its origin in the prosecution of the insured person by the society for having obtained sickness benefit under false pretences. There were five instances in respect of which the insured person was charged. In the first two of those instances, however, the doctor by whom the incapacity was certified is now deceased. The magistrate rejected the summonses on those two counts and dealt with the last three in which the practitioner who is referred to in this case certified the incapacity. The insured person eventually pleaded guilty and was sentenced to three months' imprisonment in the second division in respect of each charge, the sentences to run concurrently. The practitioner was present at the police-court, and, having regard to what he is stated to have informed the magistrate, the society felt it their duty to raise the question of the practitioner's certification with the committee, the society alleging that the practitioner had been careless in the matter. . . . . The second illness began on June 11th, 1925, the insured person being certified by the practitioner on that date as incapable of work by reason of a Colles's fracture. We understand that this was sustained by the insured person through having fallen in the street. An operation was performed at a hospital on June 18th, 1925. The practitioner continued to certify the insured person as incapable of work up to and including Jan. 15th, 1926, when a final certificate was given, this certificate being endorsed by the practitioner "Colles's Fracture. Not cured." As to this illness the society drew particular attention to the certificates dated respectively Sept. 15th and 22nd, 1925. These certificates were written on Form Med. 40 B, and indicated that the insured person would remain incapable of work for a period of four weeks from the date of the certificate. In the first of these two certificates the practitioner stated that the cause of the incapacity was a "United Colles's Fracture," while in the second he indicated that the fracture had not united in spite of operations. The next certificate, which was an ordinary certificate, was dated Nov. 7th, 1925. The next certificate received by the society was dated Dec. 10th, 1925, and this was a monthly certificate. It is clear that this particular certificate was not written by the practitioner, and it was stated by the practitioner that the insured person must in some way have appropriated a form, already stamped, from the practitioner's surgery and, after completing it, sent it to the society. The final certificate was given on Jan. 15th, 1926. On Jan. 13th, 1926, the insured person was instructed to attend for an examination by the Regional Medical Officer. This he did not do, and the society were told by the Regional Medical Officer that the practitioner had reported to him that the insured person "began work long over a month ago." The society then communicated with the practitioner and asked him if he would state the date of the final certificate, as it had not been submitted to them. The practitioner replied to the society to the effect that he had given the Regional Medical Officer incorrect information, his statement having been based on information received by him from the insured person, but that he had sent another letter to the Regiona Medical Officer.

There was a battle royal over this case. The subcommittee that first heard it reported that the allegation as to carelessness in certification was not proven. At the main committee, however, certain members took a different view and moved that he had failed to comply with the Medical Certification Rules, and that he should be censured and reported to the Minister with a view to a fine being imposed. Subsequently this motion was withdrawn and it was moved that he be cautioned. This was passed by a large majority. Against this he appealed and won, the following being a part of the report of the officers appointed by the Minister to hear the appeal.

The appellant maintained before us that he still thought that during the whole of the three periods the insured person was unfit to follow his occupation as a driver of a motor-omnibus. He did not consider the question whether the insured person was fit to follow any other occupation, because he thought there was a probability that he would recover sufficiently to be able to resume his ordinary occupation. He contended, therefore, that he was fully justified in certifying him to be "incapable of work." He thought at the time in question, and he still thinks, that the insured person was in such a condition that he could not drive a motor-omnibus without grave danger to himself as well as to his passengers. With regard to the issue of the two special intermediate certificates, he said that when he issued the second he had forgotten for the moment that he had issued a similar certificate shortly before. When he gave the first he thought the fracture had united, but before he issued the second he had revised his opinion and was satisfied that union had not taken place. He said that in such cases it was sometimes difficult to say definitely whether the fracture had united, and a further examination might not infrequently lead a medical man to form an opinion different from that based on a previous examination.

In this case we have to deal with the allegation that the appellant showed carelessness in his certification of the insured person. In our view the allegation has not been established. On the evidence laid before us we think that the appellant had sufficient grounds for forming the opinion that at the relevant times the insured person was "incapable of work," and for certifying to that effect, and, therefore that his appeal succeeds.

Now although this doctor was finally cleared he was put to much trouble to gain this end; and it may be worth while to inquire how he got himself into such a quandary. In the first place, he apparently used to sign blank forms for others to fill in just as the sister of my ward wanted my house surgeon to do. In the second place, he issued a

further certificate before a former one had run out, and in the third he had to admit he had given wrong information to the Regional Medical Officer. On medical grounds he was perfectly sound. He was of opinion that the man was unfit for his work, and the fact that the man did work did not alter this opinion.

Increase of Sickness and Disablement Claims.

So much for the statement of fact in the certificate. I now pass to a much more important point. The number of people who are drawing sickness and disablement benefit has increased enormously between the years 1921 and 1927. All who are taking part in the administration of these acts view with concern the state of affairs that is resulting from this. A white paper has been published (Cmd. 3548) dealing with an investigation of the Government Actuary into the matter. It was to this that the Minister of Health referred in the House of Commons on April 29th. From it we learn that the claims for sickness benefit has risen—

Among men	by	41 per cent.
,, unmarried women ,,	60	,, ,,
,, married ,, ,,	106	,, ,,

The really important fact is the growth in the number of claimants and not in the average duration of claims within the year.

Thus the percentage of insured persons claiming sickness benefit has risen as follows :—

	Men.	Unmarried women.	Married women.
1921	14	12	19
1927	23	21	38

Again the increase in claims for sickness benefit was most marked among the younger members of the population and for the shorter periods of illness :—

Ages	16–44	45–54	55–64
	Per cent.		
Under 1 week ..	70	43	34
1–2 weeks	82	58	28
2–3 ,, ...	88	68	31
3–4 ,, ...	71	65	18

As to the seriousness of the position I may quote the Controller of the Insurance Department at the Ministry of Health—Sir Walter Kinnear—who, in a recent address at the Faculty of Insurance, said :—

"Viewed from the standpoint of either the sociologist, the economist or the administrator, the figures just given cannot but occasion disquietude. Neither sex nor age is immune from the tendency to continuous increase in the claims expenditure, and it is impossible to predict that the peak has yet been reached. . . . .

"Obviously the prolonged spell of industrial depression through which the nation is still passing must be an important contributory factor towards these results. There are, no doubt, many insured persons who will work as long as work is available even though their state of health may be such as would justify a claim for sickness benefit. When work is not available, these persons automatically come on the funds, and their ranks become increased by many whose physique is debilitated by prolonged unemployment.

"It is impossible to measure the extent to which the growth of the sickness claims has been accelerated by economic forces, but it is obvious from the figures that the growth has been out of all proportion to the increase in the burden of unemployment and that a complete explanation must be sought elsewhere. In that field of speculation it would not be profitable to travel very far, but the disconcerting increase in the sickness claims of women, and especially married women, as compared with men, points to the probable operation of certain economic factors, such as the relation of sickness benefit to wages, the family responsibilities of the individual, and the fear of subsequent unemployment where incapacity is prolonged."

But it may be asked where does the doctor come in ? The answer to this is that not one of these persons can draw sickness benefit for a single day without a medical certificate. This is the axle upon which the whole administrative wheel is supported and revolves.

Now I am not going to admit for a moment, as some people are prone to suggest, that the whole of this increase in sickness benefit is due to lax certification upon the part of doctors. Unemployment undoubtedly leads to increase in illness in many ways which it is unnecessary to detail here. But I do think there is some laxity of certification, and that it behoves the medical profession to take stock of their position and to help in facing this problem. By laxity of certification I wish to distinguish from wrong certification. Up to now we have been considering the latter, but in lax certification we deal not with statements of fact but with the condition of the patient and the opinion based thereon. When we sign a certificate are we sure that the condition of the patient warrants his remaining away from work ? Two cases that have come under my notice within a week suggest there are many where this deduction is not warranted :—

CASE 9.—A man came to my out-patient department with nasal polypi. We were to remove them at out-patients at several sittings at intervals of about a fortnight. The most that it was necessary for him to be off work was 24 hours after each seance. Yet I discovered at the end that he had been drawing sickness benefit for eight weeks. He said that this was because his employer had said it was no use coming back until the job was finished.

In this case the doctor who had signed the certificates must either have had a very lax idea of how much illness was needed to keep a young man from work ; or else he suffered from a confusion of thought between the employer's convenience and the funds of the nation.

CASE 10.—A telephonist from whom I had removed tonsils had a recurrence of her attacks of aphonia. From this she got better, but she got another week's certificate until I could see her.

This is a more difficult case ; as the doctor might have feared she was in for something serious. Sometimes these attacks are the first symptoms of phthisis in a lightly built girl. If he thought this, however, the doctor should at once have started investigations along this line, by sending her to the tuberculosis officer of the district. If he did not think so there was no reason why she should not have gone back to work and have taken an hour off to see me when I came down to that district.

So much for direct evidence. I do not like hearsay, but rumours are very persistent that many doctors dare not refuse a patient a certificate for fear the patient should leave him at once and go to another doctor. One hears this constantly from all parts, Lancashire as well as London. It is a difficult thing about which to obtain confirmatory evidence, but it is a still more difficult thing to refute.

To allow people unduly to remain away from work is bad medicine ; when we have been ill we all need a little stimulation to return, and we never get quite fit until we do. The kindly encouragement of the general practitioner with his pat on the shoulder and his quiet-spoken "Well, try for a day or so and see how you get on" must have enabled millions to resume work and to find to their surprise that they were ready for it. As our methods of practice pass into new shapes we want to retain this personal touch ; and if we do not other methods must be found to supply that stimulus. To my mind the most serious point in these figures is that the increase is most marked among the young.

Let a layman put this medical view before you—again I quote Sir Walter Kinnear.

"The effort to resume a normal life is hard to make, no doubt, when the will is enfeebled by long incapacity and the introspection it induces. But the effort itself is invigorating, and, to a certain type, no greater service can be rendered than the exercise of gentle pressure to 'try' which is expressed in the refusal of further benefit on the advice of an official medical referee."

Remember that every time you knock a person off work unnecessarily, and every time you refrain from stimulating him or her to return when fit you are helping to manufacture a valetudinarian, and every time you allow a person to step into this you are on the way to making an unemployable.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

A Hospital for Convalescence.

THE Astley Ainslie Institution was formally opened by the Lord High Commissioner on May 22nd, but has actually been in partial use for over a year. The buildings now standing in the splendid park, facing south, include the old house of Millbank, which was formerly the home of James Syme, the famous Edinburgh surgeon. Joseph Lister married Syme's daughter in 1856 and the marriage took place in the drawing-room of the mansion house. There are also two other properties—Canaan Lodge and Canaan Park. These three, and the ground attached, form the superb site for the new convalescent establishment. This contains a kitchen department, nurses' home, scientific department for treatment and research, and two special pavilions. The plans provide for the accommodation of 150 patients, with a staff of 42. The scientific department contains research laboratory, radiographic and radiotherapeutic installations, a gymnasium for remedial exercises, a dental room, a dispensary, and other offices. There will also be open-air shelters, sun-baths, and recreation grounds for patients.

This splendid endowment was left by Mr. David Ainslie of Casterton, who died in 1900, and directed his trustees to apply the residue of his estate to "the purpose of erecting, endowing and maintaining a hospital or institution for the relief and behoof of the convalescents in the Royal Infirmary of Edinburgh." The name "Astley" has reference to Mr. Ainslie's nephew and heir, John Astley Ainslie, who predeceased him. The Board of Governors represent the Royal Infirmary, the College of Justice, the Royal Colleges, the Edinburgh Merchant Company, the Chamber of Commerce, Society of Accountants, the Presbytery of Edinburgh, and the Corporation of Edinburgh, along with the only surviving trustee, Mr. Scott.

The site of the institution, which commands a full view of Blackford Hill, the Braid Hills and the Pentlands, formed at one time a part of the Borough Muir, which played a great part in the history of Scotland in the sixteenth century. This was the mustering ground for the march to Flodden. In earlier days, too, it is said that the ancient chapel of St. Roque stood here, a resort for victims of the plague.

The new departure in the history of the site will not be the least important, for the institution means a very material expansion of the Edinburgh medical school. Although associated with the Royal Infirmary, it will be independent. It opens a definite prospect of detailed study of the processes of convalescence.

Infectious Disease in Glasgow.

Dr. A. S. M. Macgregor's latest report shows that the infectious diseases death-rates in Glasgow for March and April were 1·2 and 1·1 against 0·9 and 0·7 a year ago. This is mainly due to measles, the number of cases recorded for the nine months being 5020. The percentage death-rate from measles is, however, only about 2·2, which reflects the mildness of this year's epidemic. In the epidemic of 1927–28, the percentage death-rate was 3·6. For the six months ending March, 1930, the number of cases was 13,988 as against 15,802 in the previous epidemic for a similar period.

Dr. Macgregor has an interesting note on cases of acute sore-throat followed by nephritis, with two deaths. Within the last few weeks a small group of cases have been reported. "The early symptoms are severe, with fever, and there is no evidence that the condition is due to scarlet fever; swabs from the throat are negative for the hæmolytic streptococcus, although this organism was recovered in one instance where three members of a family had nephritis following acute sore-throat, and in one or two of the other sporadic cases. The general hospitals report no increase in admissions for nephritis during the past three months, but, in view of the possibility of the presence of a throat infection followed by this complication, I shall be glad to receive information from medical practitioners who may have had recent experience of illness of this nature."

The late Dr. Robert Robertson.

Dr. Robert Robertson, who died on May 18th, was one of the best-known general practitioners in Edinburgh. He graduated in medicine at Edinburgh University in1888 and took the B.Sc. in public health a year later. In his early days he developed a large practice and it was a pleasure to discuss medical problems with him, partly because of his very wide experience as a general practitioner and partly because of his freshness and originality. He was practical and at the same time critical. He had a very alert, speculative mind and took a keen interest in all current public health problems, serving for a considerable period as an active member of the Edinburgh Town Council. He was a competent critic of hospital conditions and he did not hesitate to express his views; but he was always fair and considerate both of the medical officials and of any lay opponents. In personal conversation one was always struck with his grasp of general principles and his quiet but broad humanism. His mother is now 104, and it is said that he paid her a visit every day of his life. It was precisely what one would expect of his sympathetic and understanding temperament.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Medical Benefits for Northern Ireland.

THE Northern Ireland National Health Insurance (Medical Benefit) Bill was issued on May 14th. There was also issued a White Paper explaining the measure, and it sets out the main objects of the Bill as follows: (1) to include in the National Health Insurance Scheme a system of medical benefit; (2) to provide for an increase in the contributions payable under the National Health Insurance Acts; (3) to provide for the administration thereof; (4) to give effect to an agreement entered into with dispensary doctors with regard to the terms of insurance practice; and (5) to make alterations for the treatment of tuberculous insured persons. Since the commencement of the National Health Insurance Scheme in 1912 medical benefit has formed an integral part of the scheme in Great Britain, but Ireland was excluded so far as these provisions were concerned. The Bill proposes to extend the provisions of the National Health Insurance Act to insured persons in Northern Ireland so as to make them entitled to medical benefit on the same lines as insured persons in Great Britain. The Ministry of Labour is to be responsible for the administration of medical benefit with the assistance of a medical benefit council to act in an advisory capacity and certain local committees to deal with local problems. These bodies will replace the existing insurance committees. The medical benefit council will be representative of insured persons, employers, medical men, chemists, and certain members nominated by the Ministry of Labour. It will confer with and advise the Ministry on administrative questions, and will inquire into complaints referred to it by the local committees. These local committees will be representative of doctors, chemists, and insured persons, and will deal with the provision of medical benefits for persons failing to secure acceptance by doctors, and with complaints about treatment and supply and quality of medicines. In addition, committees will be established composed of representatives of the panel doctors and of chemists for questions of exclusive concern to both. One of the most important points in the Bill deals with the present dispensary system. Many persons who at present attend dispensaries for medical treatment are insured persons. Under the new scheme these will be entitled to treatment from a

panel doctor who in many cases will be the local dispensary doctor. It becomes necessary then to effect an adjustment in the remuneration payable to these medical officers, and they have agreed to undertake insurance practice subject to a reduction of 1*s.* 6*d.* in the rate per head ordinarily payable to insurance doctors for insured persons (9*s.*). Their present rate of pay as dispensary doctors will be unaltered. For the effective administration of the National Health Insurance scheme it is desirable that those in receipt of benefit should be visited at regular intervals, but as the insured population is scattered widely over Northern Ireland and is distributed over a large number of societies, it is not possible to do this fairly and effectively without some form of unified scheme available to all societies. The Bill provides that such a scheme be set up and controlled by the societies themselves, but should they be unable to do so before Jan. 5th, 1931, the Ministry may take the necessary steps to provide such a scheme. The domiciliary treatment of tuberculosis in insured persons will become part of the duty of the panel doctor under the medical benefit scheme. As regards the institutional treatment, this will be carried out by the county tuberculosis committees.

Introduction of the Bill.

The Minister of Labour, in introducing his Bill, stated that the death-rate in Northern Ireland was 3 per 1000 higher than in England. This had been attributed to climate and to factory life, but the climate in Northern Ireland and factory conditions were as good as in the North of England. The approved societies considered the high death-rate was due to the non-adoption of medical benefits. Some of the members criticised this, stating that the high rate of emigration left Northern Ireland with a large percentage of old and frail inhabitants; also, that if the inspection of school-children were more generally adopted the death-rate would be lower. Prof. R. J. Johnstone, M.P., who acted as chairman of the Local Government Commission which sat for three years to consider the whole question of the poor-law, summed up the feelings of the majority of medical men and social workers in Northern Ireland when he said in the debate on the Second Reading: "The lack of opposition to the Bill shows that at last public opinion in Northern Ireland is beginning to have a conscience in regard to public health. I am perfectly certain that this measure of public health will be only the forerunner of others that will remove the reproach that we are less interested in public health than the people of other civilised nations. I should have liked to see the recommendations of the Local Government Commission put into effect, with a revision of the entire administration of the public health and medical supply services. It is bound to come and I am sorry it has not come now."

Grants in Aid of Scientific Research.

For the purpose of encouraging and assisting scientific research the Ministry of Education for Northern Ireland is prepared to make grants to a limited number of research workers and students of approved qualifications. The grants, which will be made on the recommendation of the Advisory Board, will be of two kinds: (1) maintenance allowances to enable students to undergo training in research, and (2) senior research awards to enable young investigators of exceptional promise and proved capacity to devote their whole time to original research. Maintenance allowances, which will not exceed £100 and will not be tenable for more than two years, are for students recommended by the professor as able to take full advantage of the facilities for training in fundamental scientific research and who intend to take up a career in which they will devote the whole or part of their time to research work. The senior research awards will not exceed £250 per annum or be tenable for more than three years. The awards will be open to candidates who are not more than 27 years of age and who are recommended by the head of the laboratory or department in which they have been working. The investigators will be expected to publish the results of their research and will not be permitted to make commercial use of them without the previous consent of the Ministry of Education.

Dublin Hospitals and Religious Tests.

In the Dail last week, in the course of a discussion on certain Government grants which are paid to a few of the Dublin hospitals, it was stated by a deputy that the charter of one of the hospitals concerned—namely, the Rotunda Hospital—made it a condition of the appointment of its Master that he should be a Protestant. A suggestion was also made that the present Master had been induced to change his religion in order to render himself eligible for the post. On the following day Deputy Sir James Craig, on the authority of the Master of the Rotunda, gave an unqualified contradiction of both suggestions, and the deputy responsible for them expressed his regret for having made a statement on misleading information. It is, perhaps, just as well that the opportunity arose for giving a public denial to the widespread rumour that a religious test is a qualification for the Masterhip of the Rotunda. In only one of the Dublin Hospitals, as far as is known, is the profession of any particular form of religious belief a necessary condition for appointment to the staff. It is true, however, that some of the hospitals, having close association with particular churches or religious orders, are likely to have the majority of the members of the staffs in religious sympathy with such churches or orders.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

The Lübeck Disaster.

THE Lübeck disaster has caused much public alarm, for the number of deaths has risen to 21, and more of the children will probably die. A provisional report has been issued by Prof. Ludwig Lange, of the German Health Office, who was sent to Lübeck by the Government to make an inquiry. He stated that the infection was probably due to the administration of tuberculous material. It has not yet been ascertained for certain, he says, how the tubercle bacilli were introduced into the vaccine, but they were obviously already present at the beginning of the treatment. According to observations in various countries, a return of B C G bacilli to virulence has never occurred. It is thus probable either that tubercle bacilli were present in the cultures sent from Paris or that they were introduced into later cultures. It had not been proved that the cultures were adulterated by negligence in the Lübeck laboratory, but a final explanation can only be given after thorough investigation in the laboratory, which will take several weeks. Replying to a question in the Reichstag, the Minister of the Interior said he had instructed the governments of the individual States of Germany to abstain from using Calmette's method until the facts have been cleared up. A medical member, Dr. Moses, said that the Lübeck authorities had acted with great negligence in distributing a remedy which even in France was not quite established. They had informed the Health Office only 20 days after the first cases of infection were observed.

Prof. Calmette has stated in an interview that it is only to French hospitals that the Pasteur Institute supplies vaccine ready for use. To hospitals abroad the Institute does no more than send cultures from which vaccines can be prepared. Those sent to Lübeck were examined before dispatch and were found innocuous, and the Pasteur Institute is therefore not responsible for the disaster. In France, said Prof. Calmette, 225,000 children were treated by his method between July, 1924, to April, 1930, and no harm was done to any of them.

The German Surgical Congress.

The German Surgical Association held their annual meeting in Berlin from April 23rd to 26th, with Prof. W. Anschütz, of Kiel, in the chair. The first official subject of discussion concerned hæmorrhage and styptics and was introduced by Prof. R. Stich, of Göttingen, who said that high-frequency currents had proved useful as a hæmostatic. The second theme was operation on the vertebral column introduced by Prof. V. Schmieden, of Frankfurt. For vertebral tuberculosis he recommended conservative treatment, but if a cervical vertebra is dislocated Albee's operation is useful. He uttered a warning against opening the dura mater, because of the possibility of infection. In the discussion the majority spoke against Albee's operation. Prof. Rein, of Freiburg, reported that it has been observed that the circulatory organs of surgeons show signs of strain on days of over-exertion after severe operations. The mortality of surgeons is high, and circulatory troubles are the commonest cause of death among them, which occurs on the average ten years earlier than among other people. Operations for gastric ulcer were reported on by Dr. Starlinger, of Vienna, whose records covered 25,600 operations in 85 hospitals. In 14,270 cases Billroth's method with retrocolic gastro-jejunostomy was performed. Relapse was observed in only 0·7 per cent. of the cases and was usually in the anastomosis. To avoid relapse he recommended total removal of the ulcer, the pylorus, and the antrum. A discussion on the dietetic treatment of tuberculosis was introduced by Prof. F. Sauerbruch and Dr. A. Hermannsdorfer who showed numerous patients. It was attested that even desperate cases of tuberculosis were saved by the treatment. Prof. P. Clairmont, of Zürich, confirmed these observations, and there was also a demonstration of cases of lupus successfully treated by the method.

Six Days' Bicycle Race.

Dr. Conrad lately read a paper before the Berlin Medical Society on medical observations during a six days' bicycle race. He said that injuries produced by a fall when travelling at a speed of 60 km. per hour are often less dangerous than those in cyclists going slowly. At high speeds the muscles are keyed up and the possibility of a fall is provided against subconsciously. Among surgical sequels fracture of the articular fossa of the scapula is especially frequent. Constipation is a characteristic feature, and is caused by excessive perspiration producing inspissation of the fæces. Infection of the gluteal skin by friction of the saddle is a common result of prolonged cycling. The heart of professional cyclists is, as a rule, much enlarged.

Constipation in School-children.

Dr. Hinsche, a school medical officer, writing to the *Zeitschrift für Schulgesundheitspflege*, is of opinion that constipation is due less to sedentary occupation than to the impossibility of evacuating the bowels at the usual time and of taking long enough over it. This is especially the case with the children who get up too late in the morning and eat their breakfast in haste so that they have no time for defæcation. The early hour at which school begins in Germany contributes to the rush. In the schools children are generally not allowed to visit the w.c. during the lessons and the condition of the privies, which are sometimes dirty and cold, may discourage their use at other times. Constipation in school-children is not a morbid condition, but is caused by external causes which might easily be removed.

Treatment of Diseases of the Adnexa.

Dr. Loeser reports in the *Centralblatt für Gynäkologie* on his experiences with subcutaneous injections of living gonococci. He has performed 1600 injections in women suffering from chronic gonorrhœa of the cervix and the adnexa, and he says that 76 per cent. were cured within two to six weeks. The chances, he claims, are still better if, during the two first weeks, a small rod of Parthagone or some other silver preparation is introduced into the cervix. This therapy is a specific one, unlike the injections with the vaccines on the market, and it is often useful when other therapeutic measures have proved ineffective. The gonococci used by Loeser came from cases of florid gonorrhœa, and were cultivated in ascites agar.

Dr. Bauer has used fibrolysin in chronic diseases of the adnexa and in post-operative infiltration of the pelvis. It is contra-indicated in acute and subacute inflammation of the true pelvis and in specific inflammation caused by gonorrhœa, tuberculosis, and actinomycosis. Injections of 0·1 g. are made into the muscles every four to ten days, the number of injections being, as a rule, four to ten. He says that in 65 out of 250 cases where the usual treatment had been unsuccessful the infiltration so much decreased under this treatment that the patients no longer complained; in 30 per cent. a considerable improvement was obtained, and in only 5 per cent. did the condition remain unchanged.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 17TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox 324 (last week 462); scarlet fever, 1927; diphtheria, 1210; enteric fever, 65; pneumonia, 919; puerperal fever, 60; puerperal pyrexia, 110; cerebro-spinal fever, 16; acute poliomyelitis, 3; encephalitis lethargica, 10; dysentery, 2; ophthalmia neonatorum, 117. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on May 20th-21st was as follows:—Small-pox, 513 under treatment, 22 under observation (last week 568 and 22 respectively), scarlet fever, 2016; diphtheria, 2414; enteric fever, 29; measles, 879; whooping-cough, 64; puerperal fever, 23 (plus 16 babies); encephalitis lethargica, 120; poliomyelitis, 1; "other diseases," 20. At St. Margaret's Hospital there were 19 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (1) from enteric fever, 96 (36) from measles, 8 (3) from scarlet fever, 27 (3) from whooping-cough, 37 (9) from diphtheria, 44 (10) from diarrhœa and enteritis under two years, and 37 (3) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever outside London were reported from Manchester and Newcastle-on-Tyne. Fatal cases of measles are still widely scattered; Darlington reported 7, Willesden, Warrington, and Middlesbrough each 4, Croydon, Tottenham, Plymouth, Liverpool, and Stockton-on-Tees each 3. Middlesbrough reported 3 fatal cases of whooping-cough. Seven deaths from diphtheria occurred at Liverpool, 3 at Plymouth. Diarrhœa was credited with 5 deaths at Birmingham, 4 at Liverpool.

The number of stillbirths notified during the week was 333 (corresponding to a rate of 46 per 1000 births), including 56 in London.

A SHROPSHIRE COTTAGE HOSPITAL.—Lord Bridgeman recently performed the opening ceremony of the Annabelle, Lady Boughey Hospital at Newport, Salop. The lady whom it commemorates, and who died in 1914, was the wife of Sir Thomas Fletcher Boughey, of Aqualate Hill, Newport, the eldest of five brothers who held the baronetcy in succession between 1880 and 1921. She bequeathed a sum of £15,000 for the establishment of the hospital, which has been increased by accumulations to £27,000. The building, which has cost £15,000, consists of two blocks, a fully equipped theatre, and an X ray department.

GENERAL MEDICAL COUNCIL.

PRESIDENT'S ADDRESS.

AT the opening of the one hundred and thirty-first session of the Council on May 27th, Sir Donald MacAlister, the President, referred to the death, since their last meeting, of Principal John Yule Mackay, for many years chairman of the Education Committee. "His eminence as a scientific anatomist," he said, "and his experienced capacity as an educational administrator, gave weight and distinction to his often laborious contributions to our proceedings." Mr. Samuel Osborn had resigned his membership after five years' tenure as the representative of the Apothecaries' Society of London, his place being taken by Lieut.-Colonel Charles Thomas Samman.

Indian Medical Degrees.

"The position," said [Sir Donald, "which I outlined in my address last November, with regard to Indian qualifications, was not modified by any action taken by the authorities prior to Feb. 24th of this year. The Executive Committee, to whom by the standing orders is delegated the statutory responsibility of recognising overseas diplomas, and so of guaranteeing that every holder thereof possesses the requisite knowledge and skill for the efficient practice of medicine, surgery, and midwifery in this country, felt that the authoritative information placed at its disposal by the Indian authorities was inadequate and defective. The Committee was, in fact, no longer in a position to give this country the guarantee of sufficiency required by law. Accordingly, the conditional recognition which since 1922 had been granted until February, 1930, to certain Indian medical degrees, in the hope that a satisfactory method of official standardisation and guarantee might in the meantime be brought into operation, lapsed on non-fulfilment of the conditions laid down. Until, therefore, a central body, such as the proposed All-India Medical Council, is established by Indian legislation, and is empowered to control and pronounce upon provincial medical qualifications and standards in India, the diplomas referred to, while they may be held to meet the local needs of India itself, will not be registrable here as conforming with the requirements of practice at home.

"This decision was reluctantly but inevitably arrived at, after much patient and sympathetic consideration of present difficulties in India. It was duly transmitted to the Secretary of State for India and the Indian Government; but no further official communication on the subject has been received. It is, however, understood that steps towards central legislation will not be undertaken before, at earliest, the session of Assembly in the autumn.

"The Registrar," he added, "has drawn up, from the minutes of the Council since 1921, a memorandum setting forth the successive steps in the long-drawn-out negotiations with the Indian authorities that have led up to the present position."

Privileges of Foreign Practitioners.

The Council had been asked by the Foreign Office, through the Privy Council, for information regarding the rules governing the privileges of foreign practititoners, not registered in our register, in respect of practice among patients in hospitals established for the treatment of foreigners in this country. The question had arisen whether any such privileges might be extended to British practitioners practising in hospitals established in France for the treatment of British subjects. The law, said the President, is contained in Section 6 of the amending Medical Act, 1859, and is as follows:—

> Nothing in the said Act (Medical Act, 1858) contained shall prevent any person not a British subject who shall have obtained from any foreign university a degree or diploma of doctor in medicine, and who shall have passed the regular examinations entitling him to practise medicine in his own country, from being and acting as the resident physician or medical officer of any hospital established exclusively for the relief of foreigners in sickness: provided always, that such person is engaged in no medical practice except as such resident physician or medical officer.

The French authorities, it is understood, are considering the subject, with a view to an agreement to confer corresponding privileges on British practitioners in relation to hospitals for the treatment of British subjects in France. The terms of such an agreement have been drafted with the assistance of the officers of the Council.

Pharmacopœia.

The Pharmacopœia Committee would report on the progress of the work of revision undertaken by the Pharmacopœia Commission. The preparation of a revised text was in an advanced state; but in view of the considerable amount of new matter, in relation, for example, to biological methods of testing under the Therapeutic Substances Act, and otherwise, it appeared unlikely that the new Pharmacopœia would be ready for publication before the end of this year. The Commission and its Committees are, said the President, diligent in their devotion to the tasks assigned to them, and with their chairman, Dr. Beddard, deserve the grateful acknowledgments of the Council. The Privy Council have forwarded the text of the International Agreement respecting the pharmacopœial unification of potent remedies, drafted by the Brussels Conference of 1925, and approved by the Council subject to certain reserves. The text has been communicated to the Pharmacopœia Commission for its guidance.

Examinations.

The cycle of inspections of final examinations was now being carried out continuously by Dr. Wardrop Griffith, Mr. Farquhar MacRae, and Dr. Fairbairn. Reports on a number of licensing bodies had already been received by the Examination Committee, and would in due course be submitted to the Council for transmission to the Privy Council. Visitations of particular professional examinations by members of the Council had taken place, and the visitors' reports were under consideration by the Examination Committee. It appeared that the complex subject comprehending materia medica, pharmacy, pharmacology, and therapeutics, was very variously dealt with by different licensing bodies. "The time seems to have come for considering," said Sir Donald, "whether greater uniformity in the systematic instruction in methods of treatment, medicinal and other, has not become desirable and practicable." A report on the subject was to be presented at the present session.

Preventive medicine as a part of the medical curriculum had been occupying the attention of the Committee, and much valuable information on the place given to it by the medical schools and licensing bodies had been gathered from the visitors' reports. Here, also, the great variety of emphasis assigned to the subject in different quarters seemed to call for serious consideration. The Council of the Society of Medical Officers of Health had presented to the Council a careful and detailed report on the matter from an influential committee appointed by them, and this had been referred to the Education and Examination Committees, in the expectation that they would find it of assistance in framing conclusions for submission to the Council.

The Education Committee had further considered the question of the methods in use for the teaching of the applications of the pre-clinical subjects, chemistry, physics, biology, &c., during the later (clinical) years of the curriculum. Fuller and more detailed information than was available last November had been gathered, and their conclusions would be reported pending the completion of the cycle of inspections.

Registration of Foreign Students.

The Committee had also had before it the question of the ascertainment and attestation of the certificates presented by applicants for registration as medical students from foreign countries. These presented difficulties that had, within the last few years, become embarrassing, in view of the very large influx of intending medical students from overseas. In some cases the number of such applicants exceeded those from this country, and it became the more important to ensure that their general educational qualifications were not inferior to those required of our own students, or indeed to those required in their own country, for admission to professional degrees and diplomas. "The question," said Sir Donald, "will call for careful and perhaps expert investigation, and for friendly communication with the overseas authorities concerned."

At the conclusion of his address a vote of thanks to the President was proposed by Sir NORMAN WALKER and seconded by Sir HOLBURT WARING. The Council then passed to the consideration of penal cases.

DENTAL BOARD OF THE UNITED KINGDOM.

THE CHAIRMAN'S ADDRESS.

AT the opening of the eighteenth session of the Board on Wednesday, May 14th, the Chairman, Sir Francis Dyke Acland, delivered an address in which he reviewed the present position of the dental profession mainly from the economic standpoint in a discursive but interesting manner. Dealing with the numerical make-up of the profession he suggested that the rising annual entry to the dental schools was a proof that under the Board the profession had become more attractive, and speaking as layman he suggested that statistics were against what he termed the argument of the open door. He contemplated a cessation to the dislike of recent legislation manifested by the public, who, from a natural antipathy to privileged callings, regretted the day when "anyone, however poor, could become a dentist; he had only to take up a forceps and start." The Chairman believed that although the transition period was hardly yet over the general public was becoming more accustomed to regard the dental profession as resembling other professions—namely, privileged for the public good, while the bursary scheme furnished a reply to the difficulty of enabling the poor man to become a dentist.

On the question of whether the figure of 14,000 dentists, at which it was proposed to maintain the register, was high enough, the chairman pointed out that as health services developed there should be so much the less dentistry required as general health conditions improved. He pointed out, further, that when a man works as a school dentist or in a clinic the overhead charges which a dentist must carry whenever he is not working are largely eliminated, and he can afford to do more work for less money and will do more work in less time than a dentist in private work. If this can occur in a clinic because the patients are arranged to suit the dentist's time rather than the public convenience, it followed that the extent to which dentistry is carried on in clinics will be related to the number of dentists needed.

Sir Francis concluded his address with some general remarks on the present and probable future position of dentistry as a benefit under health insurance, laying stress on the need for dental treatment, especially between the ages of 16 and 19. He compared the present dental benefit scheme to rain, saying, "One has rainy periods and less rainy periods, fine days and wet days; rain may be a deluge or a sprinkle, it may do great good or none, and it never really comes when one wants it most. Each point of comparison can be made good—rainy periods and less rainy periods—because though there are so many millions entitled to dental benefit at one date, there is, I think, no certainty that there will be the same number entitled to it at another. Fine days and wet days because the scheme of dental benefit is full of gaps, for some societies give no benefit at all and never have done. The rain varies in intensity, and here, though the analogy is perhaps weak, it still holds good, for some societies adopt one scale, some another, a matter which has caused great feeling and friction. Rain may do great good or none—so may the dental benefit scheme, for unless the insured person can pay his share of the estimate the whole scheme is nugatory. And rain never comes when I want it most, nor does dental treatment which I want most between 16 and 19. There are five things, three of which it seems possible to put right fairly quickly and the other two can be got right some day if we clearly see the present facts as evils and help to get them remedied . . . If those now negotiating about insurance practice can help to secure that societies shall always provide benefit, that all societies shall provide benefit, and that the benefit shall be on a uniform scale, they will have done three good things and they will deserve well of the public and of the profession, and in this connexion there can surely be no distinction between the two. Then two things remain, and the first is, how to help those who at present cannot afford their share, and I believe that in some places people would save if a saving system were organised, and slightly helped. The second point is that from the point of view of public health we want to shorten the gaps in people's lives during which dental treatment depends not on design but chance, which means that there generally isn't any. These gaps are obvious, the period under school age, the period after school age and before insurance begins, and the waiting period after insurance begins before there is any dental benefit. Looking at the matter as a whole, things are improving for, with the extension of the school age, the second gap will be shortened. But I am dealing now with the last period. I believe it has recently been shortened from five years to three, which is splendid. But if I pay an insurance premium for fire, and my house burns down next day, I get paid, provided I did not set it alight. And though I know, of course, that the scheme of health insurance is utterly different from that of fire or life insurance, it should not be beyond the wit of man to prevent the principles upon which it is built from operating permanently as defects."

UNIVERSITY OF MANCHESTER.—From May 22nd to 24th this university celebrated the eightieth anniversary of its foundation as Owens College and the jubilee of its foundation as the Victoria University of Manchester. On May 23rd honorary degrees were conferred, amongst others, on Dr. J. Lorrain Smith, F.R.S., professor of pathology in the University of Edinburgh, who has for several years been professor of that subject at Manchester.

MIDDLESEX HOSPITAL CLUB.—This club, which held its annual meeting last week, was founded many years ago with the idea of arranging reunions. An annual subscription is paid by the members with a view to building up a fund which can be used to relieve old Middlesex men in distressed circumstances or to assist in any scheme for the benefit of the hospital or medical school. At the last meeting a further sum of £250 was voted for a squash racquets court for the residents.

KING EDWARD'S HOSPITAL FUND FOR LONDON.—The annual meeting of this Fund for the purpose of receiving the accounts and reports was held at St. James's Palace on May 27th, when the Prince of Wales, who presided, read a message from the King, expressing his pleasure at the results of the Thankoffering Fund and the gifts received from Sir Otto Beit and Mr. Roger Parr, which had enabled the Fund to lend a large supply of radium to hospitals. The activities of the Fund during 1929 were fully described at the meeting on December 14th, which was reported in our columns at the time (THE LANCET, 1929, ii., 1355).

Correspondence.

"Audi alteram partem."

THE CAUSATION OF ECLAMPSIA.

To the Editor of THE LANCET.

SIR,—I have read Dr. G. W. Theobald's paper in your last issue (p. 1115) with interest. It is gratifying to find that the auto-intoxication theory of eclampsia is making such progress. Some amendment, however, seems necessary to Dr. Theobald's argument. May I deal with a few points?

Dr. Theobald believes that the poison comes from the gut. It is absorbed by the blood and passes to the liver. In order that it may affect the individual a defective liver must be postulated; and this, as Dr. Theobald admits, exists. But, according to him, the fits are not due, certainly or only, to this toxin; "the fits," he says, "are probably caused by a sudden drop in the level of the blood-sugar associated with a hypocalcæmia"—that is, I take it, a result of a failing liver per se. Dr. Theobald indeed adds that the fits may result from "hæmorrhages into, or œdema of the brain." But eclampsia either is due to toxins absorbed from the gut which enter the general circulation unchanged or insufficiently changed, or it is not.

The next point concerns the renal state. We know quite well that if an Eck's fistula be performed in the dog and the animal be given meat, convulsions appear, even though the kidneys are normal. Even Dr. Theobald, I suspect, cannot think that however changed becomes the liver in women about to become eclamptic, the blood can rush through that organ at such a rate or in such a manner as to produce a condition comparable with that determined by an Eck's fistula in the laboratory. It is difficult to believe that in the pregnant woman, however hard she works or however much she eat (unless she vomit persistently) the liver becomes unable in any degree whatever to deal with the toxins absorbed from the gut. Thus, to explain the effect of toxins in the general blood produced by this cause, one must postulate that the kidneys are also inefficient. But Dr. Theobald states that "it is abundantly clear that the kidneys are not concerned in the ætiology of eclampsia." That does not seem consonant with the opinion of the majority of observers. It is not a question of albumin being in the urine; albuminuria matters little, what matters is the excretion of toxins or waste products; not only those absorbed from the gut, but those produced by other parts of the organism, and which passing either at once or later the liver guard insufficiently changed must affect the general well-being unless excreted sufficiently quickly by the kidneys.

The third point concerns the cause of the liver defection, clearly the key to the problem. "The liver," says Dr. Theobald, "carrying out metabolic functions for both mother and fœtus and overwhelmed by an excess of toxins, fails. . . " In parenthesis, we may well ask why the kidneys, concerned also with the increased metabolism, should not also fail. Apart from that, why does the liver fail? Is it simply the result of overwork? Such an idea, even though in pregnancy an increased work for the liver should be in operation for some time, is difficult to accept. Why should not the liver hypertrophy to meet the increased demands, as Herring has stated it does in the rat? Is it to be believed that in women the liver cannot somehow make itself capable of bearing the increased burdens laid on it during pregnancy, provided its blood-supply be adequate? The answer seems supplied by the relative infrequence of eclampsia in multiparæ. The condition in primigravidæ, however, is different. The increased tautness of her abdominal wall, says Dr. Theobald, "causes greater embarrassment to the intestines." The increased embarrassment of the intestines causes more toxins to be produced and more to be absorbed; and it is because of the increased embarrassment of the intestines that the liver becomes overloaded with work (Theobald). But, surely, an increased tension of the abdominal wall in primigravidæ, serious enough to embarrass the intestines, must at the same time embarrass the liver and even the kidneys. In that case, if the woman continue to be active and to eat, it is not surprising that toxins should enter the general circulation and cause morbid manifestations.

Even Dr. Theobald's explanation demands that the pressure within the abdomen is increased. But Dr. Theobald has burned his boats. In a previous paper he has stated that the intra-abdominal pressure is not increased in pregnancy.[1] How, then, can he believe that the intestines are seriously embarrassed in primigravidæ, in virtue of the "bulk" of the uterus and the tautness of the abdominal wall? Dr. Theobald believes that the intra-abdominal pressure is (? always) a little less than that of the atmosphere; but if that were so, the erect posture would not be possible.

I am, Sir, yours faithfully,

R. H. PARAMORE, F.R.C.S. Eng.

Rugby, May 25th, 1930.

To the Editor of THE LANCET.

SIR,—I am in agreement with Dr. Theobald's thesis that eclampsia arises from intestinal toxæmia, with damage to liver and often kidneys; disturbance of the blood calcium and sugar content; the strain of pregnancy on the detoxicating mechanism of the liver, together with the demand by the fœtus for calcium leading to a condition that ends (or may end) in convulsions and often death. I would like briefly to refer to a few special points: (*a*) The high incidence of eclampsia in Glasgow. (*b*) Seasonal incidence. Although I am sure that cosmic and telluric influences have a great bearing on the health of our bodies, I do not find that these cases occur only (or chiefly) in the cold season. (*c*) Why are the inhabitants of South China, Siam, &c., free from pregnancy toxæmias? During a residence of eight years in charge of a hospital for the Chinese I never saw one; and yet they have as unhealthy gastro-intestinal tracts as could be found anywhere from pyorrhœa to helminthic-infected intestines. Is it diet? I do not recall hearing of pregnancy toxæmias or eclampsias occurring in European (meat-eating) women in the East. Is it the absence of sunlight that depresses metabolism and detoxicating mechanism? Osler says that tetany is epidemic in the dark winter months in Norway. (*d*) In the defensive mechanism I include the parathyroid glands. (*e*) The view that eclampsia is intestinal hepatic toxæmia plus the added strain on the mother's detoxicating resources clarifies things enormously. I have noticed the occurrence, at certain times of the year, of a run of cases of acidosis, cyclical vomiting, asthma, and digestive disturbances; and at the same time, a run of acute appendices, gall-bladder infections, perforated ulcers, toxæmias of pregnancy, and eclampsias. The urinary findings are often similar, except that the evidences of liver and kidney disturbance may be more in evidence in the latter. It was these recurrent findings that led me to recognise the basal unity of the different conditions. It is said that eclampsia is only found associated with pregnancy. If it is a breakdown in the defensive barrier to intestinal toxins, with injury to liver cells (and kidney cells) due to calcium deficiency and hypoglycæmia, such a condition might conceivably arise apart from pregnancy.—I am, Sir, yours faithfully,

R. CHALMERS, M.D., F.R.C.S.E.

Darlington, May 24th, 1930.

THE MECHANISM OF PULMONARY COLLAPSE.

To the Editor of THE LANCET.

SIR,—In a letter which you published in your issue of March 1st (p. 482) I discussed the causes of non-collapse of the lung when laid bare by external chest wounds which do not pierce the visceral pleura. An

[1] Theobald: Pressure Caused by Abdominal Tumours, THE LANCET, 1930, i., 904.

illustrative example has come to my notice. On p. 149 of "All Quiet on the Western Front," describing an event from the German side in the recent war, it is stated "Westhus drags off with a great wound in his back through which the lung pulses at every breath." I should be grateful if any of your readers could cite, from their own experience, similar cases showing that the freely exposed lung remains distended and does not collapse.

I am, Sir, yours faithfully,

P. WATSON-WILLIAMS.

Clifton, Bristol, May 21st, 1930.

THE STERILISATION OF HYPODERMIC NEEDLES.

To the Editor of THE LANCET.

SIR,—The annotation on broken hypodermic needles in your issue of May 17th opens up the unsatisfactory question of the sterilisation and storage of hypodermic outfits in general. Correspondence on this subject would probably be both interesting and instructive.

If steel hypodermic needles are sterilised in olive oil at its boiling point, and, after use, washed through with two changes each of distilled water, surgical spirit and ether, impelled in an outward direction by means of the syringe, being subsequently dried by air similarly impelled, they will not rust or block, nor, barring accidents, do they seem to get blunt, whilst the ease and painlessness of the injection, owing to the lubrication in itself repays any possible extra trouble.

Such needles can either be stored in the oil or lightly oiled and stored dry. I have in my possession needles treated in this manner which, although at a mild estimate used more than 50 times each, appear as good and bright as ever, the only part showing wear being the plating of the holder, scratched from frequent manipulation with forceps. It is of interest to note that the tedious process of searching for, picking up, and inserting the tiny wire stilette appears unnecessary in this method. For obvious reasons the oil-sterilised needles should not be used for drawing the solution into the syringe, this duty being best performed by a platinum-iridium needle of fairly wide bore, kept for the purpose only and sterilised by flaming. A substitute which does not possess the unpleasant smell of boiling olive oil would be welcome.

The advice that a fresh needle should be used for each injection is a counsel of perfection, but in a course of 12 injections it would involve an extra cost of from three to nine shillings, or more than twice this sum if stainless steel were used, though prices as quoted in different catalogues vary widely. This is a consideration, in view of the increasing use of hypodermic, intramuscular, and intravenous therapy. Needles showing any discoloration, roughness, or rusting should be discarded forthwith. Breakages usually occur from erosion at the junction of needle and holder, and it is therefore wise to keep the proximal one-eighth of an inch of the needle in view during the process of injection, especially in intramuscular cases, so that extraction with forceps can be carried out in case of accident.

Whatever method is adopted in sterilising syringes and needles, provided sterilisation is effective, and the comfort of the patient and welfare of the outfit taken into consideration, a period of time measured in minutes is necessary. If there is real necessity for extra haste, or circumstances are unfavourable for routine procedures as, for instance, in road or rail accidents, recourse can be had to the Tubunic ampoule syringe (Hoffmann la Roche) or similar principle in which solution, syringe, and needle in sterile condition are so arranged as to be ready for instant use.

I am, Sir, yours faithfully,

Rustington, Sussex, May 23rd, 1930. W. E. WALLER.

TREATMENT OF G.P.I. BY INJECTION OF SULPHUR.

To the Editor of THE LANCET.

SIR,—Dr. Noel G. Harris, in the paper published on p. 1068 of your issue of May 17th, gives a preliminary report on his results with the treatment of general paralysis by injection of sulphur. On the whole, this report is confirmatory of my paper[1] on the therapeutic effect of sulfosin, but I would like to make a couple of comments upon it. Harris prefers to give the injection at about 7 P.M., instead of giving it in the morning as suggested by me. Whether the injection is given in the morning or in the evening makes no difference in its therapeutic effect; so the time of injection is mostly a matter of convenience. I heartily agree with him in emphasising that each patient should be studied as to his individual capacity for responding to the injection pyrexia. I myself have never employed any fixed increase of dosage. I also agree with his statement that the earlier the pyrexial treatment is instituted in cases of general paralysis, the greater is the chance of recovery. The great advantages of sulfosin therapy are that the treatment may be instituted at once and anywhere, since one may always have it at hand ready for use without any preparations—and that it may be given unhesitatingly, because, unlike malaria therapy, it is perfectly safe.

I am, Sir, yours faithfully,

Odense, Denmark, May 22nd, 1930. KNUD SCHROEDER.

BLOOD-PLATELET COUNTS.

To the Editor of THE LANCET.

SIR,—Dr. Willinsky's very interesting researches on the variation of blood-platelet counts, published in your last issue (p. 1126), do not provide any direct evidence in support of Howel Evans's theory of post-operative thrombosis as, unfortunately for his investigations, no case of thrombosis occurred in his series, although the count reached over a million in three of the recorded cases. A. Kristenson, who uses a direct method for counting blood-platelets (*Act. Med. Scand.*, 1928, lxix., 227), reports that in a series of spontaneous venous thrombosis, not associated with operation, clinical signs of thrombosis were preceded by a fall in the count. He refers to the work of E. Normann (*Act. Med. Scand.*, ibid., p. 479), who confirms this fall in the blood-platelet count in post-operative thrombosis. E. Kolozc has pointed out (*Wien. klin. Woch.*, 1928. xli., 1342) that the great difficulty in investigating blood-platelets lies in their easily altered form and structure. Her technique for counts is an indirect method which gives results from 600,000 to 900,000 as normal. She argues that the "fragility" of the blood-platelets is a very variable factor in different diseases, and explains the discrepancy between different methods of counting.

I am, Sir, yours faithfully,

Bristol, May 24th, 1930. FRANK BODMAN.

BACTERIAL BLOOD CULTURES.

To the Editor of THE LANCET.

SIR,—In your issue of April 12th (p. 821) Dr. R. J. V. Pulvertaft condemns the use of sodium citrate and solid media in blood culture work. I have had considerable experience in the Caribbean in culturing the blood of patients suffering from infections with the beta-hæmolytic streptococcus and find both of these agents to be of great value. It has been my custom to take 15 c.cm. of blood into 1·5 c.cm. of 10 per cent. sodium citrate (Merck), and to place 0·5 c.cm., 1·0 c.cm., and 2·0 c.cm. into three

[1] THE LANCET, 1929, ii., 1081.

bottles each containing 40 c.cm. of phosphate glucose broth. The same quantities of blood were mixed with 10 c.cm. of ox heart agar and three plates poured therefrom. The advantage of the solid medium is that it enables one to identify hæmolytic colonies at once, to determine the degree of hæmolysis in the weakest dilution, and to detect contaminating organisms. The use of liquid medium alone increases the time taken to isolate a strain of beta-hæmolytic streptococcus, owing to the fact that the original liquid culture has to be streaked on a blood-agar plate to detect the hæmolytic colonies. It also increases the risk of losing the strain altogether for, if contamination has occurred, the contaminating organism usually outgrows the streptococcus overnight, and the strain can only be saved by the expenditure of considerable time upon the pouring of plates and subsequent fishing of colonies.

I am, Sir, yours faithfully,

ARTHUR W. GRACE.

Pathological Laboratory, Public Hospital, Kingston, Jamaica, B.W.I., May 13th, 1930.

SANATORIUM AND AFTER.

To the Editor of THE LANCET.

SIR,—Reflection on the work done at Papworth, Preston Hall, and other settlements, and on your leader and special article of May 24th, suggests the question: Can nothing further be done for the much greater number of the tuberculous who are, physically or otherwise, unsuitable for such settlements, and who are probably still more unsuitable for life in an ordinary community? Keeping in view the object, as stated by Dr. P. C. Varrier-Jones, "to stamp out tuberculosis," it would seem that to prevent highly infective persons, who are unfit for any employment, and who must be maintained, from returning to their families, to the common lodging-house, or to other unsuitable houses, must be worth a great amount to any population. Any capital invested in such an undertaking, which I believe is quite feasible, would be returned many times over in the saving on treatment, as the numbers infected by exposure would certainly be much diminished. Under any scheme adopted, those segregated would be made reasonably comfortable and content, and the measure of its success would be the extent to which it was able to prevent the return of those who were most dangerous, from the public health point of view, to their old mode of life.

I am, Sir, yours faithfully,

WALTER CRANE,
Principal Resident Medical Officer,
Fazakerley Sanatorium, Liverpool.

May 27th, 1930.

ROYAL MEDICAL BENEVOLENT FUND.—At a recent meeting of the committee 49 grants were voted amounting to £1025. The following were some of the cases helped:—

Widow, aged 47, of M.R.C.S. who died in February, at the age of 46 leaving his widow and two boys, aged 16 and 13. The widow expects to have an income of £100 a year. The Fund has undertaken to pay the school fees and maintenance of the two boys for this term; this will mean an expenditure of £42. This grant will relieve the widow from immediate anxiety and give her time to look for employment herself, which she hopes to find, for she is a fully trained nurse. The elder boy of 16 will leave school at the end of this term and find employment.

M.R.C.S., aged 75; widower; has been an assistant for the last eleven years, but has recently had to retire owing to defective hearing and impaired eyesight. He is now living with his step-son, upon whom he has no direct claim. The step-son is a country clergyman and without means. Applicant's only income is the old age pension. Voted £40.

M.R.C.S., aged 60, with wife and child aged 6. Had to give up practice in 1928 owing to paralysis. He has a pension for incurables of £20 which is his only income; his wife has £130 a year. Voted £40.

Widow of L.R.C.P. & S., aged 76. Has an Epsom pension of £40 and old age pension of £26. Fund voted £25 to bring the total income to £91 a year.

Subscriptions and donations should be sent to the Hon. Treasurer, 11, Chandos-street, Cavendish-square, London, W.

Obituary.

FRANK RICHARDSON BLAXALL, M.D. LOND., D.P.H. CAMB.,

DIRECTOR OF THE GOVERNMENT LYMPH DEPARTMENT.

WE much regret to record the death on May 24th of Dr. F. R. Blaxall, the head of the Government Lymph Department at Hendon, which occurred in his sixty-fourth year at his residence, Brantwood, Edgware.

Frank Richardson Blaxall studied at University College, London, taking the English conjoint diploma in 1888, and in the same year graduating in medicine in the University of London with honours. Having held the resident posts at the hospital as house physician and obstetric assistant, he became assistant medical superintendent at St. Pancras Infirmary, and for a time held a post with the Ocean Steamship Company. In 1890 he proceeded to the M.D. Lond., he shortly afterwards took the diploma of D.P.H. Cambridge, and in 1893 commenced his real life-work with his appointment as lecturer in bacteriology at the Westminster Hospital medical school. Here he did some work on ringworm in collaboration with Dr. Colcott Fox, then physician to the skin department of the hospital, and this was followed by association with Prof. Allan Macfadyen at the Lister Institute of Preventive Medicine, a paper on Thermophilic Bacteria being published by them in the *Journal of Pathology and Bacteriology* in 1894. Sir Richard Thorne Thorne, then principal medical officer to the Local Government Board, appointed Blaxall as bacteriologist to the Government Vaccine Laboratories while the Royal Commission on Vaccination, appointed in 1889, with Lord Herschell as president, was still sitting. The evidence given before this Commission was issued from time to time in interim reports, and Dr. S. M. Copeman, who had already been working for some three years on the employment of glycerin for the preservation of vaccine lymph, gave evidence before the Commission and was instructed by the Local Government Board to make arrangements with Blaxall to carry out a further series of experiments on the lines indicated in the evidence. At the instance of the Local Government Board, however, before taking up his official duties, Blaxall made an extended tour of the continent with a view to inquiring into the whole subject of vaccination as understood in the various vaccine institutions of other countries, and when he commenced in 1898 what proved to be his official work for the next 32 years of his life he was thoroughly well equipped both in principle and in detail for dealing with the many problems presented by the subject. How faithfully he had dealt with them is well illustrated by the following which we have received from one of his senior colleagues at the Ministry of Health:—

Sir George Buchanan writes: "Combining Local Government Board and Ministry of Health services, Blaxall had for several years been the senior of the medical officers of the central public health department. On the usual official reckoning we should at least have had another year of active work from him, and have found it as invaluable as ever. His was one of the expert posts in the civil service of which little or nothing is heard so long as, and because, it is quietly and efficiently run. When this has been said of Blaxall over duties so liable to meticulous criticism as the supply of vaccine lymph, there can be no higher tribute to his work. The distressing news of his death reaches me abroad and away from references, or I would turn to and quote from records which show how, since the vaccination legislation of 1898, he successfully established the Government Lymph Establishment at Hendon on a system which has given us continuously a supply of vaccine for the public vaccination of the country that can confidently challenge comparisons with any other system in the

world. I would in particular have reckoned up what was involved in the supply of vaccine to the forces during the war, and what that meant in terms of their freedom from small-pox. It is well to recall that Blaxall's work at Hendon was no mere routine duty or mechanical repetition. In everything relating to his subject he was always ready to receive, weigh, try out and apply new knowledge. Within the last few years I had the privilege of attending with him at vaccination conferences at The Hague and Geneva at which almost every aspect of vaccinia and lymph preparation was reviewed by experts of acknowledged authority from many countries. Nothing was more striking than the way in which Blaxall in a short time came to be recognised as master of this whole subject. On one point after another, new as well as old, it was clear that he had thought and worked it out, and was legitimately sure of his facts; his opinion carried more and more weight as the conference came to understand the man and the solid work he represented. To lifelong friends and colleagues in the department, who had learnt how implicitly they could trust in and rely upon him, Blaxall's loss is indeed heavy."

Dr. Blaxall's unexpected death followed on a very short illness. He leaves a widow, three sons, and one daughter. The funeral took place on Tuesday last at the Golder's Green Crematorium.

EDWARD DALTON AGNEW, M.R.C.S. ENG.

Dr. E. D. Agnew died at Bishop's Stortford on May 18th in his seventy-third year. He was the son of the late Major-General Agnew, of the Bengal Staff Corps, and before adopting medicine as a profession he was for a short while a tea-planter in Assam. Eventually he proceeded to the College and Hospital of St. Bartholomew, where he became a regular member of the hospital Rugby XV., and after taking the conjoint qualification, went to Bishop's Stortford in 1890. For nearly 40 years he was actively engaged in general practice there; he retired a little over a year ago, and was in good health until quite recently. Among other appointments held by him was that of medical officer to the Stortford poor-law institution, and until his retirement he was the senior member of the medical staff of the Bishop's Stortford Hospital. "Dr. Agnew," writes a colleague, "was a man singularly upright and direct in character, quite incapable of any sort of pretence or dissimulation, and this led him sometimes to candid expression. He was thorough and careful in his work as in everything he did.

"He had wide interests in sport and literature, and had been a keen cricketer and golfer. He was also much interested in Freemasonry, having been a member of the Stortford 409 Lodge for nearly 40 years. Of strikingly handsome appearance, generous and kind in his disposition, and possessed of great charm, he endeared himself as doctor and friend to a wide circle."

Dr. Agnew leaves a widow and three married daughters.

PRINCE OF WALES'S HOSPITAL.—This Tottenham institution is seriously in need of a new out-patient department. In 1909, when the accommodation was barely adequate, there were 11,600 patients; in 1929, with no additional accommodation, there were 28,700. In the former year the admissions were 628; last year they numbered 2589. Some £15,000, about half the cost of the new department, has been raised.

HULL CONTRIBUTORY SCHEME.—A town's meeting at Hull last week decided to establish a contributory scheme to help to maintain the Royal Infirmary, the Victoria Hospital for Sick Children, the Hospital for Women, and the Hull and Sculcoates Dispensary. Membership is open to workers whose income does not exceed £6 a week, their wives and dependents. The weekly contributions are twopence and threepence. Already 96 per cent. of the employees of the firm of Reckitt have decided to join the scheme.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

MILK AND TUBERCULOSIS.

ON Wednesday, May 21st, the House of Commons went into Committee of Supply on the Civil Service Estimates, Mr. R. YOUNG in the chair.

On a vote of £1,332,310 for the salaries and expenses of the Ministry of Agriculture,

Pure Milk for School-children.

Mr. WINTERTON said the situation was becoming one of great urgency in all milk-producing districts. Before long the prices of milk would be fixed and the farmers would be at a tremendous disadvantage owing to the great surplus of milk which would exist, unless some means were taken to induce a larger consumption. He therefore urged the Minister of Agriculture to accept the suggestion which had been made that steps should be taken during the five months when there was likely to be a glut of milk to give every school-child for five days in the week a supply of milk. He believed that the local authorities would respond to this suggestion and thus help to form a milk habit among children.

Mr. SMITHERS: Would the hon. Member also press that the milk should be free from tuberculosis?

Mr. WINTERTON said that of course he wanted pure milk given to the children, and the research department of the Ministry would be anxious to secure that only the very best milk was supplied. He believed that the farmers would welcome the scheme and would be willing to supply milk at the very lowest rates. He suggested that the Minister should circularise the local authorities, asking them to convey to the education authorities a suggestion on those lines. He also asked whether the research department of the Ministry had looked further into the question of the use of preservatives in cream, and had satisfied themselves whether boric acid in small quantities could be added to cream so that the market could be strengthened for real cream as against some of the artificial cream offered for sale at the present time as British cream. He also urged that the Minister should do everything by speeches in the country and otherwise to encourage the drinking of more milk.

Veterinary Inspection.

Mr. BUXTON (Minister of Agriculture) said that the Ministry was spending something like £50,000 a year on animal disease research. That was not enough; there ought to be expansion, and he hoped that it would be possible to go ahead shortly. Dr. Hastings had raised in the debate in the previous week the question of tuberculosis and milk. Rapid eradication would not be possible without unduly depleting our herds and incurring enormous expense, but a great deal was being done. The Tuberculosis Order of 1925 covered the cases of cows giving tuberculous milk, and also bovine animals infected in a much less dangerous way. The Order required farmers to report cases, but it was sometimes difficult for others than experts to detect tuberculosis, and he had consulted with the Minister of Health on the extension of periodical veterinary inspection. Local authorities had full powers to disinfect farms under the Order. Dr. Hastings had asked whether other cattle were examined. As a general rule that was done; possible "contacts" on the premises were all examined. The working of the Order was illustrated by these figures. Premises examined as a result of reports had declined from 21,000 in 1926 to 18,000 in 1929. The number of animals found infected and slaughtered also declined from 17,000 in 1926 to 15,000 in 1929. In 1929 there were 241,000 animals examined, and at that figure the animals infected within the terms of the Order worked out at 2·8 per cent. of the total—a very different figure from that which was quoted the other day. Cows and heifers giving tuberculous milk numbered only 2600, or 1·4 per cent., of the total number of cattle examined. As regarded the question of the supply of milk in schools, that was not a matter within his responsibility, but he would gladly communicate the suggestion to the President of the Board of Education.

The vote was agreed to by 248 votes to 116.

EDUCATION (SCOTLAND) BILL.

THIRD READING.

On Friday, May 23rd, on the motion for the third reading of the Education (Scotland) Bill,

Major ELLIOT said that he was greatly indebted to the House for allowing the Bill to pass its second reading *sub silentio*. It had been examined by a Standing Committee, and on the whole received favourable consideration. He had received some criticism from hon. friends on both sides of the House for having called the Bill an Education Bill, whereas in their view it was more a matter of public health. He contested that point; it was truly an Education Bill. The experiments from which the Bill arose were conducted with a view to obtaining the maximum possible use of the costly and elaborate educational machinery which the country had set up. In Scotland they had previously attached rather more importance to the training of the mind and not enough perhaps to the training of the body. Those who had received any form of biological training perhaps went to the other extreme and rather emphasised the desirability of a sound body if the sound mind was to function at all. The Bill proposed to enable education authorities in Scotland to incur expenditure in supplying milk to the children attending the schools within their areas. From the annual report of the Department of Health in Scotland they learned that the average time occupied in the examination of each child was 7½ minutes. That was the time spent on the survey of the physical fitness of each child out of the whole school year. Within that school year they were informed only one-third of the school population underwent systematic medical inspection, and accordingly they might take it that the 7½ minutes of inspection had to suffice for the child for three years. He did not think anyone could regard that state of affairs as satisfactory, and it was one of the things which had weighed with him and the former Secretary for Scotland in desiring that education should be merged in one general authority responsible for health, education, and open spaces. In the course of the report to which he had already referred was recounted a somewhat melancholy tale showing that 2·4 per cent. of the children examined were found to be suffering from anæmia and 2·5 per cent. from tuberculosis in one form or another. The Bill as introduced made no provision with regard to the quality of the milk to be provided, and the Standing Committee, after a good deal of debate, decided to make a change in that respect, and inserted a proviso that the milk to be supplied should be Certified milk, or failing that milk of the best grade available in the area. Undoubtedly that might lead to certain difficulties, and to a certain increase of expense to the local authorities, but the proviso raised the whole question of whether milk of a certain degree of infection was so bad that it should not be supplied at all, or whether the milk must be milk from tuberculin-tested cattle. He pleaded strongly for the passage of the Bill even with the insertion of this proviso. The question of tuberculous herds, and the possible transmission of tuberculosis to children through milk, was the subject of considerable controversy at present. Bovine tuberculosis was understood to cause the deaths of about 3000 children per annum in this country, and bovine tuberculosis among herds had undoubtedly caused reluctance on the part of doctors to prescribe, and on the part of the population to consume, milk which was in spite of all those difficulties the finest food and the only food which had been worked out by nature for growing animals, either the young of cows or the young of the human race. The difficulty was the relatively small number of herds where Certified or even Grade A tuberculin-tested milk could be supplied. There were 101 herds in Scotland licensed for the sale of tuberculin-free milk, whereas the total number of milch cows in Scotland was over 450,000. He did not think there was any doubt that if they could persuade local authorities to adopt this Bill the health of the school-children in Scotland would be improved.

Mr. JOHNSTON (Under Secretary of State for Scotland) said as far as he knew the object of this Bill was desired by all the large education authorities in Scotland, and Glasgow had in preparation for the measure intimated that it had a scheme ready. It was an optional Bill. Experiments had shown the urgent necessity on physical grounds for such a Bill. The Government earnestly desired that the House should give a third reading to the Bill, and give the local authorities these powers at the earliest possible moment.

Rejection of the Bill Moved.

Mr. R. W. SMITH moved the rejection of the Bill. He said certain children might have benefited by the milk supplied, but other tests had been made with regard to the conditions under which children were educated, and it had been found that children educated in schools where there was a large amount of sunlight, or in open-air schools, had improved. Therefore if they were to have a Bill covering the question of milk as affecting the health of children they ought also to deal with drugs, medicines, or foods which children needed. There was a complaint from which children suffered called acidosia which might ruin a child's life, and in such cases milk was the very worst thing possible. Why should the unfortunate children who required glucose, or any other substance, not get it also at the expense of the State? As the Bill stood education authorities, if they could not obtain pasteurised or Certified milk, might supply the best milk obtainable in the district. It was admitted that in a very large number of districts in Scotland it would be impossible to get a large enough supply of even pasteurised milk, and it seemed a very serious thing to say that they might supply children with milk which would probably contain the germs of tuberculosis.

Major ELLIOT pointed out that the scheme had to be approved by the Scottish Education Department and the Department of Health in Scotland, and he would have thought that that would have satisfied Mr. Smith that the danger of children getting actively infected milk would be obviated.

Mr. SMITH said there would be no safeguard at all, because those who spoke for the Department of Health had stated that it would be impossible to work the Bill in many areas if Certified or pasteurised milk had to be supplied, and that probably meant that in certain cases permission would be given for non-certified milk to be provided.

Mr. C. WILLIAMS seconded the motion for the rejection of the Bill, which he described as a muddle-headed measure.

Mr. BOOTHBY said those who had backed the Bill regarded it as a very beneficial measure of reform which was likely to benefit not merely the school-children, but also the farming community and agriculture generally. He hoped that later they would see a scheme for making the consumption of milk by school-children compulsory and carried through at the expense of the education authorities.

The Need of Tubercle-free Milk.

Mr. MACQUISTEN said he was very sorry that the Bill did not insist on milk absolutely free from tuberculosis. It was said that there would not be a sufficient supply, but he thought that in a very short time there would have been a sufficient supply. The population of Scotland was built up very largely for generations on milk and oatmeal. It was a pity there was no provision for the supply with the milk of decent brose, which was the best possible antiseptic for the lactic acid in the milk. Dr. Murray, who was formerly Member of Parliament for the Western Isles, told him that when he was a young man in Stornoway one could not find even people over 70 years of age with dental caries. That was because they ate raw oatcake with the milk. He remembered reading the evidence of a Scottish surgeon, given at a health inquiry, in which he said one of the reasons for there being more dental caries in Scotland than in England was that the Scottish children got milk for their meals, whereas English children got beer. So far from this proposal being a burden on the local rates, if school-children were in a better condition of bodily health that in a sense would ultimately prove an economy. He believed that the giving of this sustenance, which after all would not be very costly, would improve not only the physical condition of the children but their mental faculties, and their capacity for benefiting from the education given to them.

The Bill was read the third time and passed.

INDIAN MEDICAL DEGREES.

On Monday, May 26th, the House went into Committee of Supply on the Civil Service Estimates. Mr. R. YOUNG was in the chair.

On a vote for the salaries and expenses of the India Office,

Mr. WEDGWOOD BENN (Secretary of State for India) referred to the question of Indian medical degrees. He said that the Committee knew that the General Medical Council after considerable discussion—the point had been raised many times in recent years—decided that unless an officer, called the Commissioner of Medical Qualifications and Standards, was appointed—Colonel Needham had been designated for the post—to appraise, so to speak, the standard of the medical education given in the various Indian medical colleges, they would be unable to continue to recognise the Indian medical degrees. Owing to circumstances which he need not further describe that appointment was never completed, and the result was that the General Medical Council felt compelled to withdraw their recognition of Indian medical degrees. That was a most unfortunate thing both for the Indians and the British. The problem was urgent, and was being urgently studied by the Government in the hope that by the creation of some All-Indian medical organisation some sort of authority might be created which, manned and staffed in India, might be able to give those guarantees which the General Medical Council considered requisite before it could give

recognition to the Indian medical degrees. That something might be arranged at the earliest possible moment was in the interests of both India and this country alike.

HOUSE OF COMMONS.

WEDNESDAY, MAY 21ST.

Cargo of Narcotics for the Far East.

Mr. D. G. SOMERVILLE asked the Secretary of State for Foreign Affairs whether he could make any further statement as to the ownership, destination, and contents of the ship which recently sailed from the Persian Gulf for the Far East with a large cargo of narcotics.—Mr. A. HENDERSON replied: The ship in question is reported to be a Chinese vessel and to have sailed from Bushire on April 27th with a cargo of 2308 cases of unlicensed opium declared for Vladivostock.

THURSDAY, MAY 22ND.

Improvements at Bracebridge Mental Hospital.

Lieut.-Colonel HENEAGE asked the Minister of Health whether his attention had been called to the delay in authorising the alterations and improvements required by the visiting committee to the Bracebridge Mental Hospital; whether he was aware that the committee was being constantly referred from one Government department to another; and whether he could see his way to obviate the present delay in the interests of patients.—Mr. GREENWOOD replied: The proposals have required the consideration of the Ministry of Health and the Electricity Commissioners as to the power plant at the hospital. I will endeavour to ensure that an early decision is given.

Sewage Works Nuisance at Hanwell.

Major SALMON asked the Minister of Health if he was aware that the residents in some 300 houses on the Elthorne Heights Estate, Hanwell, Middlesex, suffered inconvenience from the odours which emanated from the sewage disposal works in the vicinity; whether his attention had been called to the proposal of the Corporation of Ealing to expend the sum of £11,500 on the enlargement of such sewage disposal works; and what steps, if any, he proposed to take to ensure that the nuisance at present arising from the works should be permanently eliminated in the interests of the health of the residents.—Mr. GREENWOOD replied: I have received complaints. The town council have applied for sanction to a loan for the improvement of the works, and inquiry into the application was recently held by one of my inspectors. On receipt of his report I will consider the appropriate steps to be taken.

Mental Treatment Bill.

Mr. WINTERTON asked the Minister of Health whether with regard to the two medical commissioners to be appointed under the terms of the Mental Treatment Bill he would favourably consider the suggestion that one of them should be a woman.—Mr. GREENWOOD replied: The Mental Treatment Bill proposes that of the five senior commissioners who are to compose the Board of Control, one shall be a woman. In the appointment of the two medical senior commissioners, it will be necessary to have regard primarily to their qualifications for advising upon the treatment of mental disorders; and I cannot give any undertaking that one of the medical commissioners shall be a woman.

Home Office and Anthracosis.

Dr. JOHN WILLIAMS asked the Home Secretary (1) whether his department had published reports of cases of anthracosis; and whether a list of persons declared to have suffered from this complaint was available at the Home Office; and (2) whether he had any evidence that anthracosis was due to special conditions obtaining in the anthracite coalfield; and whether he was prepared to include it in the list of occupational diseases which could be scheduled for the purposes of the Workmen's Compensation Act.—Mr. SHORT (Under Secretary for the Home Office) replied: The reply to both parts of my hon. friend's first question is in the negative. The investigation of the effects of coal dust on the lungs has been referred to the expert Committee on the Industrial Pulmonary Diseases, which was recently set up at my right hon. friend's request by the Medical Research Council, but it has yet to be established that the condition of the lungs described as anthracosis is the cause of disablement, and meanwhile it would not be possible to bring it within the scope of the Workmen's Compensation Act. I am advised that there is some evidence of special changes in the lungs due to the conditions in the anthracite coal field, but this is a point which will need further investigation.

Home Office and Anthrax.

Mr. DUKES asked the Home Secretary if his attention had been directed to the following fatal cases of anthrax in the Liverpool, Runcorn, and Warrington district: Walter Pritchard, 16, Ellesmere-street, Warrington, January, 1920; William Ronald Williamson, Runcorn, February, 1929; Thomas Burden, July, 1929; Ernest Hindley, Runcorn, March, 1930; Richard Andrews, 35, Fothergill-street, Warrington, April 12th, 1930; and Mary Dawbarn, 3, Glazebrook-street, Warrington, April 20th, 1930; and whether, in view of the frequency of these cases, he would set up a committee of inquiry with a view to having this disease treated more expeditiously than at present.—Mr. SHORT replied: The cases mentioned in the question were all reported to the Factory Department and carefully examined, and my right hon. friend is advised that, while in some of them the seriousness of the case may have been aggravated by some delay in recognising the disease, treatment was given without delay in every case as soon as it was recognised to be anthrax. It is, of course, most important that cases of anthrax should be recognised as well as treated without delay, and various steps have been taken by the Factory Department from time to time with this object. For example, a large placard indicating symptoms and precautions and the urgency of medical examination where infection is suspected has been prescribed for exhibition at the places of work; and a small card on similar lines is now being prepared, which the workman can keep by him and show to the doctor or hospital authorities, to indicate that his employment involves risk of anthrax. Further, special steps have recently been taken as regards the tanning industry in which my right hon. friend understands all but one of the cases referred to in the question occurred. The senior medical inspector recently addressed a circular to the hospitals in districts where cases have occurred drawing attention to the risk among persons handling hides and skins, and the importance of being on the look-out for possible cases among patients presenting themselves at the institution. Again, in a recent Home Office circular to tannery occupiers the importance of prompt diagnosis and treatment was specially mentioned, and they were urged to review their arrangements for securing this and to get into touch with local hospitals where necessary. My right hon. friend does not think that the appointment of a committee of inquiry would be likely to carry matters any further, but the subject will continue to receive close attention, and if my hon. friend has any particular suggestion to make my right hon. friend will be very glad to consider it.

MONDAY, MAY 26TH.

Cattle and Tuberculosis.

Dr. HASTINGS asked the Minister of Agriculture if he could say, having regard to the fact that of the 241,000 bovine animals examined during 1929 under the Tuberculosis Order, 1925, 2·8 per cent. only were condemned to be slaughtered, whether all the remaining 97·2 per cent. were entirely free from tuberculosis; and, if not, whether he could give any estimate of the probable number infected.—Mr. BUXTON replied: The total number of animals on premises, on which cases of tuberculosis were reported under the Tuberculosis Order, 1925, during 1929, was 621,396. Of this total 241,252 animals were examined by veterinary inspectors. Of these, 15,732 animals were condemned and slaughtered, representing 2·8 per cent. of the total number of animals on the premises, or 6·5 per cent. of the total number examined. The remainder were not necessarily entirely free from tuberculosis, but they presented no symptoms of a nature to bring them within the scope of the Tuberculosis Order as to compulsory slaughter. As regards the last part of the question there is no information upon which an estimate could be based of the proportion which might be infected.

Pensioners and Sickness Benefit.

Captain CAZALET asked the Minister of Health whether, in view of the fact that men drawing disability pensions and who were members of the National Health Insurance Fund only drew part benefit for sickness, he would take action either by legislation or administration to see that they drew full benefit.—Miss SUSAN LAWRENCE replied: Under the Act, benefit is only reduced in the case of men who are in receipt of a pension from the State at the total disablement rate. The reduction ceases to operate when a man has resumed work, and contributions have been paid for a certain number of weeks. My right hon. friend does not propose to introduce any amending legislation on the subject.

International Congress on Mental Hygiene.

Mr. MANDER asked the Minister of Health whether the Government were officially represented at the International Congress on Mental Hygiene recently held in Washington; if so, by whom; and what report had been received of the proceedings.—Mr. GREENWOOD replied: His Majesty's Government were represented at this congress by Sir Hubert

Bond, a medical commissioner of the Board of Control. Sir Hubert Bond has not yet returned to this country, and no report has yet been received.

Small-pox and Vaccination.

Mr. GROVES asked the Minister of Health which county of England and Wales had had the lowest and which the highest percentage of primary vaccinations to births during the past ten years; and how many cases of small-pox per 1000 of the population had been reported in the counties in question during the same period.—Mr. GREENWOOD replied: During the years 1919 to 1928 inclusive, the counties in England and Wales with the lowest and highest percentage of primary vaccinations to births were Leicestershire and Anglesey respectively. The total number of cases of small-pox notified during the same ten years per 1000 of the average population was 0·63 in Leicestershire (including the county borough of Leicester) and 0·02 in Anglesey.

Remuneration of Public Vaccinators.

Mr. GROVES asked the Minister of Health how many public vaccinators were now paid by salary and how many by fees.—Mr. GREENWOOD replied: On March 31st last, which is the latest date for which complete particulars are at present available, 28 public vaccinators had contracts which provided for payment by salary, and 4293 had contracts which provided for payment by fees.

TUESDAY, MAY 27TH.

Increase in the Population.

Mr. DAY asked the Minister of Health the average annual increase of the population of England and Wales for the years 1927–1928 and 1929.—Mr. GREENWOOD replied: The increase of the population of England and Wales between mid-1927 and mid-1929 is estimated at approximately 317,000, corresponding to an average annual increase of 158,500.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates were successful:—

Surgery.—E. C. Dymond, St. Mary's Hosp.; R. F. T. Finn, St. Bart.'s Hosp.; E. A. Freywirth, Heidelberg; H. G. Hind and J. H. Johnston, St. Bart.'s Hosp.; E. Lethem, Guy's Hosp.; A. Liberis, St. Bart.'s Hosp.; and J. Ross, Toronto and Charing Cross Hosp.

Medicine.—G. P. Charles, Sydney and Westminster Hosp.; A. R. Edwards, Liverpool; J. D. B. Games, St. Bart.'s Hosp.; J. Ross, Toronto and Charing Cross Hosp.; E. M. M. Shaw, Westminster Hosp.; W. H. Willis, Western Reserve University, U.S.A.

Forensic Medicine.—A. Buch, St. Mary's Hosp.; G. T. W. Cashell, King's College Hosp.; T. C. Keble, St. Mary's Hosp.; E. H. W. Lyle, King's College Hosp.; C. G. Nicol, St. Mary's Hosp.; J. Ross, Toronto and Charing Cross Hosp.; C. M. Smith, Edinburgh; A. L. Thomas, Guy's Hosp.; and W. H. Willis, Western Reserve University, U.S.A.

Midwifery.—G. T. W. Cashell, King's College Hosp.; Y. Haig, Paris; J. Ross, Toronto and Charing Cross Hosp.; A. L. Thomas, Guy's Hosp.; and W. H. Willis, Western Reserve University, U.S.A.

The diploma of the society was granted to the following candidates, entitling them to practise medicine, surgery, and Midwifery: A. R. Edwards; J. H. Johnston; A. Liberis; and J. Ross.

BRITISH COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS.—At the annual general meeting of this college, held at the Royal College of Nursing, London, on May 20th, with Prof. W. Blair Bell, the President, in the chair, the result of the election of the council was announced. At the first meeting of the new council held in the afternoon of the same day the officers were elected, and the casual vacancies created by these elections were filled. Dame Louise McIlroy was coöpted for the special purpose of representing women Fellows and Members. The following are the officers and the full council elected:—President: Prof. W. Blair Bell. Vice-Presidents: Dr. J. S. Fairbairn and Prof. J. Munro Kerr. Hon. Treasurer: Mr. Eardley Holland. Hon. Secretary: Prof. W. Fletcher Shaw. Council.—London: Dr. H. Russell Andrews, Dr. T. Watts Eden, Dr. J. S. Fairbairn, Dame Louise McIlroy, and Mr. L. C. Rivett. England and Wales: Prof. A. Donald, Sir Ewen Maclean, Dr. H. Leith Murray, Prof. Miles Phillips, Prof. H. Beckwith Whitehouse, Dr. E. Farquhar Murray, and Dr. Eric Stacey. Scotland: Prof. R. W. Johnstone, Prof. Munro Kerr, Dr. R. A. Lennie, and Dr. W. F. T. Haultain. Ireland: Prof. C. G. Lowry, Dr. Bethel Solomons, and Dr. T. M. Healy.

UNIVERSITY OF LONDON.—At a meeting of the Senate on May 22nd the Dunn Exhibitions in anatomy and physiology for 1930 were awarded to Mr. Abraham Birnbaum, of the London Hospital Medical College.

The degree of D.Sc. in physiology has been conferred on Mr. A. S. J. M. Huggett, of St. Thomas's Hospital Medical School.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—Dr. S. A. Kinnier Wilson will deliver the Morison lectures at the College at 5 P.M. on Monday, Tuesday, and Wednesday, June 2nd to 4th. His subject will be Nervous Semiology.—The Dr. Alexander Black lecture will be given by Dr. David Rorie at 5 P.M. on Friday, the 20th, and will be devoted to Folk Medicine in Scottish Ballad Literature.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—The biennial dinner of this Society was held at the May Fair Hotel, London, on May 22nd, when the President, Dr. G. Carmichael Low, welcomed a large company of members and guests; the latter included Lady Manson, Sir John Rose Bradford, Admiral Gaskell, Lieut.-General Fawcus, Sir Herbert Read, Sir Basil Blackett, Mr. Donald Armour, Col. T. R. St. Johnston, Major F. T. G. Hobday, Dr. N. G. Horner, and Sir Squire Sprigge. After the loyal toasts it was announced from the chair that the Marquis of Reading, who had intended to propose the toast of the evening, was unable to be present, but Dr. Low took the opportunity to point out how extensive and valuable his work in connexion with tropical medicine in India had been during his Viceroyalty, and how enthusiastically that work had been seconded by the late Lady Reading.

Sir John Rose Bradford, who had consented to speak in Lord Reading's place, was, said Dr. Low, the author of researches to which tropical medicine owed a real debt, although his early and special studies might have been somewhat overshadowed by his great general and professional activities. He reminded the audience that Sir John had been until lately senior medical officer to the Colonial Office. Sir John Rose Bradford, in proposing the prosperity of the Society, gave a brief sketch of its progress enumerating the names of the highly distinguished presidents. He pointed out that what it existed to promote should have a peculiarly strong appeal because the study of tropical disease was above all things one where laboratory and clinical work proceeded hand-in-hand. While the objects of medicine were threefold—to cure, to relieve, and to prevent, in tropical medicine, through researches in the laboratory, we had the most direct examples of prevention. But the results of laboratory research, he said, must never blind the physicians of to-day to the extraordinary accuracy and success with which the old clinical workers, possessing none of the modern adjuvants to research, came to accurate conclusions. Speaking as a general physician he desired to regard medicine as a branch of natural history, and in no department of medicine was this fact displayed so accurately as in tropical medicine. Dr. Low in reply told how the Society had been formed at a meeting in the Colonial Office in 1907. In enumerating the presidents, he alluded to the wonderful work of Patrick Manson, Ronald Ross, Leishman, and Bruce, and pointed out that the number of Fellows of the Society had steadily increased as its objects became known and its doors had been thrown open to persons interested, whether medical men or not. But, he said, this success could never have been achieved save through the efforts of the Society's officials, and he described the heavy debt which the Society was under to Dr. C. M. Wenyon, the honorary secretary, and Miss M. Wenyon. He closed by bringing to the notice of the audience the recently issued appeal for subscriptions to take the form of a permanent home for the Society of Tropical Medicine and Hygiene, which would also be a material memorial to Patrick Manson. Towards the object of this appeal the Fellows of the Society themselves had subscribed over £6000, but three times that sum was still required.

The toast of the Guests was proposed by Dr. Manson-Bahr in amusing terms, for he stated that there were 15 of them and although two of them had defaulted the other 13 represented a formidable combination, when he allotted places to them in accordance with football phraseology. He coupled with the toast the name of Sir Herbert Read, who had been private secretary to Joseph Chamberlain when under that great Colonial Secretary the era of tropical medicine commenced, and Admiral Gaskell the medical director of the Navy. Sir Herbert Read, the Ex-Governor of Mauritius, testified, as a result of personal visits to many colonies, to the vital work carried on by the officers of the Colonial Service and workers in hygiene and science in all regions of the world. Admiral Gaskell, in his brief reply permitted himself one political allusion, when he said that a strong Navy was not required for attack but as an insurance against attack, while to be strong the Navy must be healthy. The toast of the Chairman was proposed by Col. W. P. MacArthur.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—The branches of this society have unanimously nominated Prof. Harold Kerr, medical officer of health for Newcastle-upon-Tyne, as president for 1930–31. Dr. Kerr will take office in October.

MENTAL AFTER-CARE ASSOCIATION.—The Prince of Wales has promised to preside at the jubilee meeting of this association to be held at the Drapers' Hall, Throgmorton-street, London, E.C., on June 2nd. The other speakers will include Sir Maurice Craig, the treasurer.

LONDON CLINICAL SOCIETY.—The fifth annual Macalister Lecture of this Society will be delivered at the London Temperance Hospital, Hampstead-road, London, N.W., on Tuesday, June 24th, when Sir Robert Armstrong, Jones will take for his subject The Evolution of the Human Mind. The lecture, which will be illustrated by lantern slides is free to all medical practitioners, who are invited to bring friends.

ASTHMA RESEARCH COUNCIL.—There will be a discussion on asthma at a special meeting of the medical advisory committee of this council at 3.30 P.M., on June 5th, at 37, Russell-square, London, W.C. Those desiring to take part in the discussion are asked to give notice to the council at that address.

Sir James Dundas-Grant has been elected an honorary member of the Inter-State Post-Graduate Medical Association of North America.

BRITISH WATERWORKS ASSOCIATION.—The annual general meeting of this association will be held at Liverpool on July 9th. Among the papers to be contributed is one by Prof. J. M. Beattie on the Value of Frequent Tests in the Bacteriological Examination of Water.

ULSTER HOSPITAL FOR CHILDREN AND WOMEN.—The board of management of this Belfast hospital have opened a fund for badly needed extensions to the hospital. Mr. S. T. Irwin has resigned from the senior surgeonship to this hospital, and Mr. Cecil A. Calvert has been appointed assistant surgeon.

BLUE STAR LINE.—A cruise to the Mediterranean at exceptionally low rates will be inaugurated by the Blue Star Line to mark the first anniversary of the company's entry into pleasure cruising. The *Arandora Star*, described in our columns last year (June 15th, p. 1282) will sail on June 18th for a 14-day cruise to Gibraltar, Tangier, Spain, and the Balearic Islands. The fares for this 3500-mile cruise will vary from 24 guineas, which works out at less than 2*d*. a mile inclusive.

MEDICAL WOMEN'S FEDERATION.—The thirteenth annual meeting was held at the Medical Institute, Newcastle-on-Tyne, on May 8th, the President, Dr. Catherine Chisholm, being in the chair. Dr. Jane Walker, as honorary treasurer, reported that the two loan funds administered by the Federation continued to be of great service to young medical women desirous of entering general practice, and that all those who had benefited by assistance were making good. At the council meeting on May 9th Miss Louisa Martindale was elected President of the Federation in succession to Dr. Catherine Chisholm. The business dealt with included discussion of the reports of the Federation's committees on Venereal Disease, Public Health, Psychological Medicine, National Health Insurance, Work of Married Medical Women, the Menopause, and Dysmenorrhœa. It was reported that at the request of the Ministry of Health Committee on Maternal Mortality and Morbidity evidence had been drawn up by a specially appointed committee of the Federation, and had been presented by Dr. Chisholm, Mrs. Ivens-Knowles, and Dr. Adamson. The proposal to exclude women from continuing work at the Birmingham Hospital after marriage was discussed, and the hope was expressed that when ratification of this resolution was due next year a majority of governors of the hospital would see that such a resolution was unnecessary. A member of council reported that as a result of the efforts of the Federation the governing body of a large hospital had rescinded a resolution which would have prevented any woman from having charge of medical and surgical beds, or from becoming assistant or full physician or surgeon when due for promotion. Permission was accorded to the London Association of the Federation to publish the findings of its menstruation committee which has completed an investigation of 6000 cases. It was reported that a new (fifteenth) Association of the Federation had recently been formed by the medical women in Oxford and the district around. The Federation has now a membership of over 1300, having more than trebled its numbers in the last ten years.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
MONDAY, June 2nd.—8 P.M., ODONTOLOGY (at the Royal College of Surgeons, Lincoln's Inn-fields, W.C.). Annual General Meeting: Election of Officers and Council. Demonstration: Sir Frank Colyer will demonstrate on specimens in the Odontological Museum. Casual Communication: Mr. Gerald Harborow: A Complex Odontome. A Histological Report on the Odontome will be given by Mr. J. G. Turner.
WEDNESDAY.—SURGERY. Provincial Meeting at Birmingham.

RESEARCH DEFENCE SOCIETY, 11, Chandos-street, W.
TUESDAY, June 3rd.—3.15 P.M., Annual General Meeting. Mrs. May Mellanby: Diet and Dental Disease: What We have Learned from Animal Experiments. (Stephen Paget Memorial Lecture.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, June 2nd to SATURDAY, June 7th.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Mon., 6 P.M., Clinical Demonstration in Dermatology, by Dr. S. E. Dore. No fee.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Special M.R.C.P. Lectures at 8.30 P.M., as follows:—Tues., Sir William Willcox: Some Points in Connexion with the Toxic Effects of Lead, Arsenic, Morphine, and Cocaine, &c. Friday, Dr. H. E. Archer: The Fractional Test Meal as an Aid in Diagnosis.—ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, Broad-street, W.C. Special M.R.C.P. Lecture on Mon. at 4.30 P.M., by Mr. C. L. Gimblett, on General Medical Ophthalmology.—HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C. Special Course consisting of Lectures, Demonstrations, Surgical Operations, from 10 A.M., to 1 P.M., daily. Further particulars from the Fellowship of Medicine, 1, Wimpole-street, W.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, June 2nd.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose, and Throat Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations. 4.30 P.M., Dr. J. Browning Alexander: Pneumonia, its Complications and Treatment. (Special Lecture.)
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat, and Ear Clinics. Operations.
FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M., Medical, Surgical, and Children's Diseases Clinics. Operations.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, June 2nd.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Wards.
TUESDAY.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Mr. Hamblen Thomas: Throat, Nose, and Ear Dept. 2.30 P.M., Sir Henry Simson: Gynæcological Operations.
WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2.30 P.M., Mr. Donald Armour: Surgical Wards. Dr. Scott Pinchin: Medical Out-patients.
THURSDAY.—10 A.M. to 1 P.M., Neurological Department. Demonstration of Fractures. 2 P.M., Medical, Surgical, Eye and Genito-Urinary Departments.
FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Department. 2 P.M., Mr. Sinclair: Operations.
SATURDAY.—9 A.M., Mr. Vlasto: Throat, Nose, and Ear Operations. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Children's Department.
Daily, 10 A.M. to 5 P.M., Medical, Surgical, and Special Out-patients, Operations, Ward Visits, Anæsthetic Courses.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, June 2nd.—12 noon, Dr. Greenfield: Cerebro-spinal Fluid. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Mr. Leslie Paton: Papilœdema.
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Martin: Cerebral Vascular Disease.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Riddoch: Neurosyphilis.
FRIDAY.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of the Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Symonds: Cerebral Tumours in Children.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.
WEDNESDAY, June 4th.—5 P.M., Dr. John Cowan: The Fibroses of the Heart. (The St. Cyres Lecture.)

ST. MARY'S HOSPITAL INSTITUTE OF PATHOLOGY, W.
THURSDAY, June 5th.—5 P.M., Prof. G. E. Gask: The Value of Radium in Surgery.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.
TUESDAY, June 3rd.—5 p.m., Dr. Sydney Owen: The Care of the New-born Baby.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURE.

TUESDAY, June 3rd.—4.15 P.M., Dr. W. Dyson: Demonstration of Dermatological Cases.

Appointments.

DAVIES, J. Ll., M.B., B.Ch. Camb., F.R.C.S. Eng., has been appointed Honorary Assistant Surgeon to the Children's Hospital, Nottingham.

GIBSON, J. McI., M.D., B.Ch. Belf., D.P.H., Medical Officer of Health for Huddersfield.

LEETE, H. M., M.D., B.S. Durh., D.P.H., Medical Superintendent of the Hull Municipal Hospitals.

WALTON, W. S., M.B., B.S. Durh., D.P.H., Assistant Medical Officer and Port Officer at Plymouth.

Certifying Surgeons under the Factory and Workshop Acts: BLAINE, J. F., M.B., B.Ch. Belf. (Pontypool); and WILLIAMS, J. E. B., L.R.C.P. Lond., M.R.C.S. (Tenbury, Worcester).

Vacancies.

For further information refer to the advertisement columns.

Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £110.

All Saints' Hospital, 91, Finchley-road, N.W.—H.S. At rate of £150.

Altrincham General Hospital, Cheshire.—Sen. H.S. Also Jun. H.S. At rate of £150 and £120 respectively.

Aylesbury, Bucks County Council, &c.—Asst. County M.O., &c. £700.

Bath, Royal United Hospital. H.P. £120.

Birmingham, Ear and Throat Hospital, Edmund-street.—H.S. At rate of £150.

Blackburn Royal Infirmary.—4th H.S. £150.

Bolingbroke Hospital, Wandsworth Common, S.W.—Res. M.O. £200.

Bristol, City and County of.—Chief Asst. M.O.H., &c. £800.

Bristol, Clifton Dispensary, Dowry-square.—Res. M.O. £300.

Derbyshire Royal Infirmary.—Asst. H.S. and Cas. O. £150.

Doncaster Royal Infirmary.—2nd H.S. and 3rd H.S. Each at rate of £150.

Dorchester, Dorset County Hospital.—H.S. At rate of £120.

Dreadnought Hospital, Greenwich.—H.P. and H.S. At rate of £110.

Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.

Freemasons Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Res. M.O. At rate of £250.

Gloucestershire Royal Infirmary and Eye Institution.—H.P. and H.S. At rate of £135 and £100 respectively.

Great Yarmouth General Hospital.—H.S. £125.

Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—H.S., H.P., and Cas. Surg. O. Each at rate of £100.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. Also H.P. Each at rate of £100.

Hull Royal Infirmary.—H.S. At rate of £150.

Ipswich, East Suffolk and Ipswich Hospital.—H.S. £120.

Kent Education Committee.—School Medical Inspector. £600. Also Dental Surgeon. £550.

King's College Hospital, Denmark Hill, S.E.—Jun. Urological Surgeon.

Leeds Hospital for Women.—H.S. At rate of £50.

Liverpool Royal Children's Hospital, Myrtle-street.—Res. H.S. At rate of £60.

Liverpool, St. Paul's Eye Hospital.—H.S. At rate of £120.

Liverpool, Smithdown-road Institution.—Res. Asst. M.O. £200.

L.C.C. Public Health Dept. Venereal Diseases Clinic, Whitechapel-road, E.—Chief Asst. M.O. £600. Two Jun. Asst. M.O.'s. Each £350.

London Female Lock Hospital, 283, Harrow-road, W.—H.S. £150.

London Lock Hospital, 91, Dean-street, W.—Hon. Surgeon to Out-patients.

London Panel Committee, 17, Russell-square, W.C.—Organising and Asst. Med. Secy. £600.

London Skin Hospital, 40, Fitzroy-square, W.—Hon. Phys.

Maidstone, Kent County Mental Hospital.—Asst. M.O. £300.

Manchester Northern Hospital for Women and Children, Park-place, Cheetham Hill-road.—Sen. H.S. Also Jun. H.S. £130 and £100 respectively.

Manchester Royal Children's Hospital.—Asst. S. £50.

Margate and District New General Hospital.—Res. M.O. £125.

Middlesbrough County Borough Fever Hospital.—Asst. Res. M.O. £450.

Miller General Hospital, Greenwich-road, S.E.—H.P., and H.S. Each at rate of £125. Also Out-patient Officer. At rate of £150.

Mitcham, Wilson Cottage Hospital.—Hon. Consulting S. and Hon. Consulting P. to Ear, Nose, and Throat Dept.

National Hospital, Queen-square, W.C.—Jun. Reg. £200. Also Asst. Phys.

Northampton General Hospital.—Asst. H.S. At rate of £150.

Northampton, Mental Hospital, Berrywood.—Locum Tenens M.O. 7 gns. per week.

Nottingham General Hospital.—2nd Cas. O. At rate of £150.

Paisley District Asylum, Riccartsbar.—Clin. Asst. £200.

Plymouth, City of.—Deputy M.O.H. £750.

Plymouth City Hospital.—Res. Med. Supt. £1000.

Plymouth, S. Devon and E. Cornwall Hospital.—H.S. At rate of £100.

Preston, Sharoe Green Hospital, Fulwood.—Jun. Res. M.O. At rate of £104.

Prince of Wales's General Hospital, Tottenham, N.—Hon. Surg. Reg.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—3rd M.O. for Antenatal Dept.

Queen Mary's Hospital for East End, Stratford, E.—H.P.'s and H.S.'s Each £120. Also H.P. and Cas. O. £150.

Queen's Hospital for Children, Hackney-road, E.—H.P. Also Cas. O. Each at rate of £100. Also Res. M.O. At rate of £200.

Rotherham Hospital.—Sen. H.S. £200. Also H.P. £180.

Royal Free Hospital, Gray's Inn-road, W.C.—Asst. M.O. for Female V.D. Clinic. At rate of £350.

Royal Free Hospital, and London (R.F.H.) School of Medicine for Women, W.C.—Res. Asst. Path. £150.

Royal London Ophthalmic Hospital, City-road, E.C.—Hon. Asst. Physician.

Royal Northern Hospital, Holloway, N.—H.S. At rate of £70.

St. Marylebone, Borough of.—Asst. M.O. and Public Vaccinator. £800.

St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—Hon. Clin. Assts.

St. Thomas Hospital, S.E. — Physician. Physician to Out-patients' Dept. Asst. Dental S. Asst. M.O. for V.D. Dept. £450. Also Asst. Path. for V.D. Dept. £350.

Salford Royal Hospital.—H.P.'s. and H.S.'s. and Cas. H.S. All at rate of £125.

Salisbury General Infirmary.—Two H.S.'s. £150.

Sheffield Children's Hospital.—3rd Res. M.O. £100.

Sheffield, Jessop Hospital.—Res. M.O. £175.

Sheffield Royal Hospital.—Res. Anæsthetist. At rate of £80.

Sheffield Royal Infirmary.—H.S. £80.

Smethwick County Borough.—Part-time M.O. 1½ gns. per session.

Southern Rhodesia Medical Service.—3 Asst. and Relieving Government M.O.'s. Each £500.

South Shields, Ingham Dispensary.—Sen. and Jun. H.S.'s. £200 and £150 respectively.

Sunderland Royal Infirmary.—Hon. Phys. £500.

Talgarth, Breconshire, S. Wales Sanatorium.—Asst. Res. M.O. £250.

Wales University.—Cecil Prosser Research Scholarship. £250. Mrs. John Nixon Scholarship. £150. Lord Merthyr Research Scholarship. £200. Also Ewen Maclean Research Scholarship. £150.

Wallasey, Victoria Central Hospital.—Jun. H.S. £100.

Walsall, General Hospital.—Cas. H.S. At rate of £120.

Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £150.

Western Dispensary, Rochester Row, Westminster, S.W.—Res. M.O. and Dispenser. £150.

West London Hospital, Hammersmith, W.—Hon. Surg. H.P., H.S., Aural and Ophth. H.S. Also Res. Asst. Cas. O. Each at rate of £100.

Whipps Cross Hospital, Whipps Cross-road, Leytonstone, E.—Con. Oph. Surg. One afternoon fortnightly. £100.

Wigan Infirmary.—3rd H.S. At rate of £150.

Willesden General Hospital, N.W.—H.P. £100.

Windermere, Ethel Hedley Hospital for Crippled Children.—Res. H.S. At rate of £150.

Windsor, King Edward VII. Hospital.—H.S. At rate of £100.

Wolverhampton Royal Hospital.—Cas. O. and Res. Anæsthetist. At rate of £125.

Worcester General Infirmary.—Jun. Res. M.O. £120.

THE Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Brecon (Brecknockshire).

Births, Marriages, and Deaths.

MARRIAGES.

MORRIS—TOMSON.—On May 17th, at St. Marylebone Parish Church, Dr. Claude Woodham Morris, O.B.E., to Doris F. Tomson, younger daughter of the late Mr. and Mrs. R. S. Tomson, of Luton, Beds.

SIMMONS—FREEBOROUGH.—On April 30th, 1930, at Marylebone, John Simmons, of Chilterns, Amersham Common, Bucks, to Margery Freeborough, M.B., B.S., B.Sc., daughter of Mr. and Mrs. J. H. Freeborough, of Sheffield.

DEATHS.

BLAXALL.—On May 24th, at his residence, Brantwood, Edgware, Frank Richardson Blaxall, M.D., L.R.C.P. Lond. M.R.C.S. Eng., D.P.H. Camb., Head of the Govt. Lymph Establishment, Hendon, in his 64th year.

CUMING.—On May 24th, Richard Ingram Cuming, M.R.C.S., L.R.C.P. Lond., aged 56 years.

MOORE.—On May 19th, at Habberley Cottage, Port Carlisle, Cumberland, William Hodgson Moore, M.R.C.S., L.R.C.P., aged 69 years.

NOLAN.—On May 15th, 1930, at her residence, Down County Mental Hospital, Downpatrick, Kathleen Mary, dearly-loved wife of Dr. M. J. Nolan, R.M.S., and eldest daughter of the late Thomas Greene, Green Lawn, Ennis, Co. Clare.—R.I.P.

RICHARDSON.—On May 21st, 1930, at 28, Leicester-road, Loughborough, Cecil George Richardson, M.D., B.S. Lond., F.R.C.S. Edin., M.R.C.S., L.R.C.P., aged 47.

SANKEY.—On May 20th, at his residence, St. Helens-crescent, Hastings, Julius Ivor Sankey, M.R.C.S., L.R.C.P., Middlesex Hospital, late of Brenchley and Great Yarmouth, aged 66.

SHEARD.—On May 23rd, at Bexhill-on-Sea, William Francis Sheard, M.R.C.S., L.R.C.P., late Medical Officer of Health, Wandsworth, in his 85th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

Notes, Comments, and Abstracts.

THE EFFECTS OF ELECTRIC SHOCK.

THE pathology of electric shock still needs elucidation, and research on animals, though its shortcomings are obvious, gives valuable information not otherwise obtainable. O. R. Langworthy and W. B. Kouwenhoven have recently published the results of a series of experiments on rats.[1] Their work was concerned primarily with injuries to the nervous system; rats do not die from auricular fibrillation, and the terms of the experiments eliminated the possibility of death through burning or failure of respiration.

The two questions which they tried to answer were whether it was possible to demonstrate definite lesions of the central nervous system in all cases of death by electricity with respiratory failure, and how many cases of delayed death were due to demonstrable lesions of the central nervous system. The current was applied from a metal cap on the head to a clip on the base of the tail. The results varied considerably with the intensity and nature of the current applied. It was found, contrary to the general belief that anæsthesia and sleep diminish the effects of an electric shock, that the mortality was definitely greater under deep anæsthesia. There was no noticeable sex difference, except that pregnant rats seldom recovered. Younger animals were less resistant than older ones. At 110 and 220 volts the alternating current was more destructive than the continuous, but at 1000 volts the continuous current did more harm. The duration of the contact proved more important than it had seemed to be in previous investigations; no rat survived after an exposure to a continuous current of 1000 volts for a second or more, although several survived exposure for a fraction of a second. The paralysis, however, depended less on the time element than on the initial shock.

The experiments provide an interesting commentary on the suggestion that it is possible by artificial respiration to save an animal whose nervous system has not been burnt. A large number of rats died at once after the shock without breathing again, and many of them were found to have developing hæmorrhages in the nervous system. A continuous current left the chest completely collapsed, whereas the alternating current fixed it in maximal expansion, and the strong tonic contraction of the whole musculature persisted for several seconds after the current was interrupted. Manipulation of the chest then often initiated spontaneous breathing, and at the higher voltages artificial respiration was more successful after alternating currents than after continuous ones. It is, however, never very satisfactory in such small animals. No rat died from cardiac failure, and the heart beat strongly and regularly after the shock in nearly every case. Rats only breathed during the shock with the lowest voltage, that of the 110-volt continuous current, and the respiration stopped when the switch was opened. Breathing seldom began spontaneously and was usually abnormal for a period of varying length, a result which suggests an intense injury to the respiratory apparatus. The authors believe that few of these rats could have been saved by any method of artificial respiration, but nevertheless emphasise the importance in man of attempting rescue immediately after the shock.

Cerebral hæmorrhage was commonest in the brain-stem. It was often found that some blood had escaped into the subarachnoid space, and rupture of the arteries of the choroid plexus produced the common picture of hæmorrhage into the cerebral ventricles. Hæmorrhage into the spinal cord, an injury of alternating currents, seemed to be due to a mechanism typical for all cases, chiefly the rupture of a small artery in the posterior septum in the lower thoracic region. The blood, it appears, escapes among the posterior column fibres of the cord, producing a good deal of damage and extending for a considerable distance in both rostral and caudal directions. Minor hæmorrhage limited to the posterior columns produced little abnormality of behaviour, but in most cases the blood broke into the central canal and spread up and down, pressing on the ventral cells and injuring the tracts, and in some cases leading to a complete transverse necrosis of the cord. At autopsy the cord in the lower thoracic area of rats which had shown severe paralysis of the hinder parts was often completely disintegrated. These hæmorrhages into the cord were much more commonly found after shocks with alternating currents than with direct; the time of exposure did not seem to be very important. R. W. Urquhart[2] showed that the blood pressure rose to twice its normal height when the current was switched off, and the present authors consider that this fact would account for all hæmorrhages except, possibly, those of the spinal cord. They point out that the latter seemed to occur always at the place of greatest curvature of the spinal column. The cord, however, lies so freely in the vertebral canal that it is hard to see how even a violent pull on the spine could injure its blood-vessels. The authors do not suggest an explanation. They promise a further contribution describing the injuries to the central nervous system in greater detail.

The important part of their work, practically speaking, is the doubt which it throws on Urquhart's statement that artificial respiration will revive any animal in which no cardiac damage has occurred. They have shown that hæmorrhages incompatible with life can certainly occur in the central nervous system of rats. It would be valuable to know whether this is true for larger animals or man.

[1] Jour. of Indust. Hyg., 1930, xii., 31.
[2] Ibid., 1927, ix., 140; see THE LANCET, 1927, ii., 1001.

A MEDICINAL SPRING ON THE BEACH.

To the Editor of THE LANCET.

SIR,—I should like to bring to the notice of those of your readers who are interested in hydrology a flow of waters on the beach at Newtown, Porthcawl, Glam., which has a remarkable action on a limb immersed in it. Although the waters are much colder than the sea, they confer on the limb a ruddy appearance and a feeling of warmth. If immersed for some time in adjacent pools, though these feel much warmer, the part turns white and becomes numbed. The well is mentioned by Camden in his "Britannia" and has a tradition of being efficacious in healing pain in old wounds and arthritic joints.

I am, Sir, yours faithfully,
W. HARTLAND, M.B., B.Ch. R.U.I.

The Poplars, Porthcawl, March 31st, 1930.

BRITISH EQUIPMENT FOR HOSPITALS.

To the Editor of THE LANCET.

SIR,—May I ask for the hospitality of your columns to emphasise how desirable it is that our large voluntary hospitals should be equipped with British instruments? Although it may be taken for granted that the members of our hospital committees and the subscribers to hospital funds are patriotic men who appreciate the dire need of our home industries in the present conditions of unemployment, it is a lamentable fact that foreign surgical and electro-medical instruments, &c., are still to be found in many of our institutions.

It is safe to say that in the majority of these cases the responsible authorities have no knowledge of the facts, as in too many instances in which foreign appliances are factored by British firms some pains are needed to elucidate the position.

I trust, however, that once this matter has been ventilated, our hospital committees will ask the firms who quote prices for their equipment to give full particulars in their tenders of the factories in which the work will be carried out, so that they can satisfy themselves that the goods they purchase are not only sold by British firms, but are indisputably manufactured in this country.

The leading British manufacturers can be trusted to produce the very best instruments, so that in the long run this should not involve any extra cost, and even if in some cases additional money has to be provided at the outset the purchasers will have the satisfaction of knowing that, by their patriotic action, they are helping the classes on whom they depend for the maintenance of the institutions they administer so faithfully.

I am, Sir, yours faithfully,
J. A. CORCORAN,
Director.

National Union of Manufacturers,
6, Holborn Viaduct, E.C.

TUBERCULOSIS LEAFLETS.

THE National Association for the Prevention of Tuberculosis (Tavistock House North, Tavistock-square, London, W.C.) has issued revised editions of three leaflets: No. 3 dealing with milk and tuberculosis, No. 9, with hints on the management of children up to 5 years of age, and No. 10, with hints on the care of children of school age. Any of these may be obtained at one shilling a dozen or five shillings a hundred, post free. The practitioner will find these leaflets useful in saving his time when he has to give directions for prevention or treatment.

INFORMATION ON BIRTH CONTROL.

OUR issue of April 12th contained an account of a recent conference on the giving of Information on Birth Control by Public Health Authorities. A full report of these meetings has now been published and may be had from the Conference Secretary, Parliament Mansions, London, S.W.1. (Price 6*d.*)

Lettsomian Lectures

ON

ENLARGED PROSTATE AND PROSTATECTOMY.

Delivered before the Medical Society of London

BY SIR JOHN THOMSON-WALKER, O.B.E., M.B. EDIN., F.R.C.S. ENG.,

CONSULTING UROLOGIST TO KING'S COLLEGE HOSPITAL; SURGEON TO ST. PETER'S HOSPITAL.

LECTURE II.*—SELECTION OF CASES OF ENLARGED PROSTATE FOR OPERATION.

(Delivered on Feb. 26th.)

THE cases on which McGill and his contemporaries operated were cases where catheter life had been tried and had failed. All other cases were treated by the regular passage of the catheter. At the present time catheter life, or permanent bladder drainage, is only used in cases that are unsuitable for operation. The conditions under which cases of enlarged prostate are selected for operation have therefore been reversed. When did this change take place? Undoubtedly at the time when the perineal method was simplified by the French surgeons and the suprapubic operation was popularised by Freyer. It was one of those changes that come about almost without comment and is accepted without being definitely stated. It would seem as strange now to put all cases of prostatic enlargement on the catheter as it would, in McGill's day, have seemed out of the question to submit all cases to operation. As late as 1901 Cabot of Boston[1] expressed his view that operation should only be done in carefully selected cases, and that the greater proportion of cases should be treated by the intelligent use of the catheter. Three years later (1904) I wrote,[2] in a review on the "present status of suprapubic prostatectomy for enlarged prostate," as follows: "The question that presents itself to the surgeon in cases of enlarged prostate is not now whether catheter life, vasectomy, orchidectomy, ligature of the internal iliac arteries, permanent suprapubic bladder drainage or prostatectomy should be recommended, but whether the case is suitable for prostatectomy and, if so, what form of prostatectomy should be performed." In considering what cases are suitable for prostatectomy we have to consider: (1) the prostate; (2) the urinary organs; (3) the general condition of the patient.

It would be out of place here to discuss such elementary matters as the examination and diagnosis of enlargement of the prostate gland. I shall select two types of enlarged prostate for discussion—namely, the fibrous prostate and the malignant prostate.

The Fibrous Prostate.

The term "fibrous prostate" has crept into surgical nomenclature without any very careful definition of its pathology. A surgeon will regard any prostate of small size which causes symptoms of chronic obstruction and irritation and which resists digital enucleation as a "fibrous prostate." It is not surprising, therefore, to find a number of different pathological conditions included under this clinical term.

From a series of 185 prostates in which full histological details were obtained, I have selected those weighing 20 grammes or under as representing prostates of this type. A prostate of 18 or 20 grammes after removal does not appear larger than one would judge the normal prostate to be. There were 44 prostates of 20 grammes or under (23·7 per cent.) Microscopical examination of these specimens gave reports as shown in Table I.

TABLE I.

Adenocarcinoma	1
Adenoma with little change in stroma	14
Adenoma with amyloid bodies	3
Hyperplasia of the stroma	5
Chronic prostatitis and fibrosis of stroma	14
Multiple small calculi	7
	44

Clinical examination of these patients gave no indication as to the nature of the change. The prostate was usually regarded as slightly or moderately enlarged on rectal examination, and was elastic and movable. In one case of adenoma with multiple amyloid bodies it was noted as "granular." The calculi in these prostates were so small that they were not detected with the rectal finger. The cases of small adenoma varied in their ease of removal. Where there was an intravesical nodule the enucleation might be comparatively easy, but in some of these cases, and also in cases where no circumscribed intravesical projection existed, the enucleation was difficult and usually developed into a dissection of the prostate under the eye. In the cases of fibrosis and chronic prostatis enucleation was easy in one case and moderately difficult in another. In the remaining cases clean enucleation was not possible and the gland was dissected out under the eye. Where calculi were present there was usually a good deal of difficulty in enucleation, and most of these cases required dissection. Two other glands, larger than the group of 20-gramme prostates, were diagnosed microscopically as chronic prostatitis. They weighed 23 and 27 grammes respectively. Both these prostates had a well-developed intravesical projection. They shelled out without difficulty.

There is another type of fibrous prostate that is not included in the foregoing list. In this type an adenomatous prostate has been subjected to treatment, such as deep X ray therapy, that has caused fibrosis of the stroma, and adhesion of the gland.

From the foregoing it would appear that the surgical term "fibrous prostate" covers a number of different pathological conditions—namely, early adenomatous enlargement, chronic prostatitis, fibrosis of the stroma, scattered prostatic calculi, with fibrosis, and a form of early malignant growth which develops round the internal meatus, all of which may produce similar clinical symptoms. The condition cannot be diagnosed with certainty before operation. At operation difficulty of enucleation is the principal feature, and it may be impossible to remove the gland by this method. By transvesical dissection under the eye these prostates can be cleanly and thoroughly removed.

The Malignant Prostate.

There are two distinct clinical forms of malignant growth of the prostate that may be termed primary and secondary. In the primary malignant prostate the change in the gland is, clinically at least, cancerous from the outset; in the secondary malignant prostate the gland has at first the character of the ordinary enlarged prostate and the malignant changes are engrafted upon this. The proportion of primary malignant prostates to simple is about 1 to 6. In 2496 cases of enlargement of the prostate examined by me in private practice, there were 347 cases of undoubted malignant growth and 2149 cases of simple enlargement. Thus the percentage of malignant growth was 13·50 and of simple enlargement 86·50.

The secondary malignant growth of the prostate is engrafted on a simple enlargement of the gland. These patients come to the surgeon with the symptoms of simple enlargement of the prostate gland, and rectal examination confirms the diagnosis. The malignant growth may develop in one of three localities. It may infiltrate the base of the prostate in the neighbourhood of the internal meatus and not

* Lecture I. appeared in our issue of May 31st.

be discovered until operation is undertaken. When the surgeon attempts enucleation, the tissues at the bladder neck are found to be leathery and resisting so that no impression can be made with the finger. This is one type of the so-called "fibrous prostate" and has already been discussed. The second area that may be affected is the periphery of the enlarged gland. In these cases the examining finger recognises an enlarged prostate of elastic consistence. At one part there is a firm area, and there may be some loss of mobility of the tissues at this part. At the operation the enucleation proceeds easily except at this area, where the gland is tough and adherent, and not infrequently a leathery plaque is left behind in the wall of the prostatic bed. In the open operation this may be dissected away after removal of the prostate.

The third type is where the malignant change has developed in the substance of the enlarged prostate. The clinical features are those of a simple enlargement of the gland and at operation the enucleation proceeds smoothly. The specimen has the usual appearance of a simple enlargement of the gland. The report of the pathologist is that there are one or more areas in which the stroma of the organ has become invaded by columns of cells, and that these areas are of a malignant nature. Attention was first drawn to this type of case by Albarran and Hallé,[3] who examined 100 specimens removed as simple enlargement of the prostate and found evidence of carcinoma in 14. The subject has also been discussed by Wade,[4] Swan,[5] and myself.[6] I have since extended my observations. In 521 cases in my private practice, where a report was obtained from the pathologist on the specimen removed by suprapubic prostatectomy, there were 96 cases (18 per cent.) in which areas of carcinoma were discovered. In these cases there was no suspicion of malignancy before the operation, and the operation was performed by enucleation under the belief that the prostate was the seat of simple enlargement. In the following series of cases (Table II.) malignant disease was found on microscopical examination of prostates enucleated for simple enlargement.

TABLE II.

	Cases.	Malignant.
Albarran and Hallé	100	14
Wade	134	14
Swan	20	4
Thomson-Walker	521	96
	783	126 (16%)

The prognosis in such cases is important and interesting. I endeavoured to trace the subsequent history of the 96 cases in my series. (Table III.)

TABLE III.—*After-history of Ninety-six Cases of Enucleated Prostate in which Malignant Areas were Found.*

Died within a year from other diseases	13
Not traced	17
Alive without recurrence	41
Dead without recurrence	23
Dead with recurrence	2
	96

Sixty-four Cases without Recurrence.

	Alive.	Dead.
1– 5 years	6	9
5–10 „	28	8
10–17 „	15	6
	41	23

It will be seen in Table III. that of 66 cases traced for a sufficiently long time there were only two (3 per cent.) in which the malignant growth recurred.

URINARY COMPLICATIONS.

Of all the risks to which the sufferer from enlargement of the prostate is exposed, those connected with the urinary organs are the most common and also the most frequently fatal. These complications are, however, to a large extent amenable to treatment before operation. They are renal inefficiency and sepsis.

Renal inefficiency.—With the increasing obstruction of an enlarged prostate and the accumulation of residual urine the renal function is impaired, nitrogenous products are eliminated in reduced proportion by the kidneys and accumulate in the blood, and a train of symptoms, that we know indicate a varying degree of uræmia, arises. These clinical symptoms are invaluable in the diagnosis of renal inefficiency, but there are cases of serious impairment of the renal function where they are slight or absent, and they frequently fail to record the variations in the renal efficiency which accompany surgical measures used in the relief of urinary obstruction. For over 30 years urinary surgeons have endeavoured to measure the renal function accurately by means of special tests,[7] and of late years they have received valuable assistance from the biochemist and the physician. It is not my intention to pass in review all the tests of the renal function at present in use. It will be of greater value if I relate my personal experience in the tests that I use.

The form of renal inefficiency that results from urinary obstruction is that in which the nitrogenous products are excreted in diminished quantity in the urine and accumulate in the blood. It follows, therefore, that estimation of the activity of the kidney in excreting nitrogenous bodies, together with an estimation of the nitrogenous bodies in the blood, should give an accurate indication of the efficiency of the renal function in urinary obstruction. Urea is the chief of these nitrogenous bodies, and it is sufficient to estimate the urea excretion and the urea retention. The activity in nitrogenous excretion is measured by the urea-concentration test introduced by MacLean[7] and de Wesselow, and the nitrogenous retention is measured by estimating the urea content of the blood. In MacLean's test a urea meal is given and the blood is overloaded with urea. The urea excretion of the kidney is thus forced up to its full limit. This test overcomes one of the difficulties of the tests of the renal function—namely, that the functional activity of the kidneys is not fully exercised at any time under ordinary conditions of health. There is a margin of safety in the amount of renal tissue that amounts to more than half the total renal tissue, and there is a corresponding margin of potential function. In a series of 274 cases of enlargement of the prostate gland in which prostatectomy was performed I have tabulated the figures of the urea-concentration test. (Table IV.)

TABLE IV.—*Urea-concentration Test in 274 Cases of Cystotomy and Prostatectomy.*

	Cases.	Deaths from uræmia.
2·0% and over	194	0
1·8 to 2%	21	1 (4·7%)
1·5 to 1·8%	34	3 (8·8%)
1·0 to 1·5% or under ..	25	3 (12%)

In 194 of these cases the urea-concentration figure was 2 per cent. or over. In this class there were no deaths from uræmia. There were 21 cases where the urea-concentration figure was from 1·8 to 2 per cent. In this class there was one death from uræmia (4·7 per cent.). The urea-concentration figure was 1·5 to 1·8 per cent. in 34 cases, and of these three died of uræmia (8·8 per cent.). One death followed cystotomy, and the other two deaths were after the second stage of a two-stage prostatectomy. In 25 cases the urea-concentration figure was from 1·5 to 1 per cent. or under. Of these, three died of uræmia (12 per cent.). The principal interest in these figures lies in the cases where a high urea concentration was obtained and the patient died from uræmia, or where a low urea concentration was recorded and the patient survived.

The single death that occurred in the class 1·8 to 2 per cent. was after the second stage of a two-stage prostatectomy.

The bladder had been drained through a suprapubic cystotomy wound for six weeks on account of renal inefficiency. The urea-concentration tests made from time to time were always 1·6 or below this, but on one occasion the test rose to 1·9 per cent. The operation was a difficult and severe one, and the patient died on the third day with auricular fibrillation and symptoms of uræmia. Old-standing heart disease was present. It is possible that had the operation been a simple one this patient might have survived, but the solitary observation of 1·9 per cent. was evidently not sufficient to justify a severe operation.

The cases where the urea concentration was 1·5 per cent. and below are of extreme interest. Of the three cases that died of uræmia, two died after cystotomy without removal of the prostate. One case was a two-stage prostatectomy. Twenty-two cases with a urea-concentration figure of 1·5 or under survived the operation of prostatectomy. In three of these a preliminary cystotomy was performed, and the urea-concentration figure, after an interval of one to several weeks, rose to 2 per cent. or over, and all survived the second stage. In ten cases where the urea remained at 1·5 or under a second-stage prostatectomy was performed and the patients survived. Nine cases where the urea concentration was 1·5 per cent. or under survived a single-stage prostatectomy, following preliminary drainage by the indwelling catheter.

The conclusion that may be drawn from these 274 cases is that there is no risk of uræmia following prostatectomy if the urea-concentration figure is 2 per cent. or over, but that there is a slight risk where the reading is 1·8 to 2 per cent., and that a single reading of 1·9 per cent. is not sufficient to establish the case in this safe zone. There is a very serious risk where the figure is below 1·8 per cent., and more so where it is under 1·5 per cent. Further, with extreme care it may be possible to operate successfully even where the urea concentration is below 1·5 per cent. Such patients may recover where no complications arise such as bronchitis, hæmorrhage, or sepsis, but they stand very little chance of surviving a complicated post-operative course.

Estimation of the urea content of the blood gives additional information about the functional activity of the kidneys in the excretion of nitrogenous bodies. In the azotæmic type of renal disease that occurs in urinary obstruction urea does not begin to accumulate in the blood until the kidneys are seriously damaged. It is, therefore, only in cases of advanced disease of the kidney that the estimation of the blood-urea is likely to be of use to the surgeon. The normal urea content of the blood is from 20 to 40 mg. per 100 c.cm. MacLean points out that these figures are too low in dealing with old men, and a blood-urea of 40 to 50 mg. per 100 c.cm. may be present without indicating serious impairment of the renal function. It is recognised that the ultimate cause of the symptoms grouped under the term uræmia is not the accumulation of urea in the blood, but this accumulation runs closely parallel with the production or the accumulation of the chemical body that causes uræmia. The parallelism is not, however, always so close as to make the blood-urea figure an absolutely reliable test of the imminence of uræmia. It is possible, for instance, for a patient to die of uræmia and the blood show a low urea content. MacLean describes a case where the blood-urea was reduced from 120 mg. to an average 30 or 40 mg. per 100 c.cm., yet the patient died of uræmia. A very low protein diet may so reduce the blood-urea as to make the observation worthless. Again it is possible to have a very high blood-urea and the patient be in no danger of uræmia. As de Wesselow points out,[8] "there is a whole series of conditions in which inadequate water is available for excretion of urea, and in which the blood-urea reaches a high level as the result, even though no renal lesion is present. The rise in blood-urea is favoured by the fact that desiccation in itself leads to excess of katabolism of protein and to excessive urea formation." Further, an excessive protein diet will raise the blood-urea content. In most cases, however, the urea content of the blood varies inversely to the percentage of urea secreted in the urea-concentration test and, as the range of figures is wider, the test is more sensitive to temporary variations in the renal function, if sources of fallacy such as diet and fluid intake be controlled. I have noticed that while the urea-concentration figures may remain steady for some time at a low level, the blood-urea figure may during this time show considerable variation, which closely corresponds to the improvement or retrogression in the general condition of the patient. The blood-urea content is invaluable in watching the progress of a case where the bladder has been drained for chronic retention with serious renal inefficiency.

In another class of case blood-urea estimation is of great value. A patient known to suffer from renal inefficiency develops symptoms of coma or cerebral irritation or some other group of symptoms that are not clearly uræmic. The presence of a high blood-urea may elucidate an otherwise obscure problem. I have met with examples of this in relation to renal tuberculosis, as well as during convalescence from prostatectomy.

It is not necessary for a successful prostatectomy that the renal function should be perfect or even approximately perfect. A reduced renal function may be adequate for the operation. The laboratory figures of the renal function tests form only one factor among many in estimating the prognosis for operation. The general build and constitution of the patient, the soundness of other organs, the experience and skill of the operator and of those who have the immediate care of the patient after the operation, and the surroundings in which recovery from the operation will take place are all factors that profoundly influence the result.

Sepsis.—Sepsis in relation to the enlarged prostate and prostatectomy is a failure of surgical methods. The infection may occur before the operation, it may be introduced at the time of the operation, or it may occur subsequent to the operation when the cystotomy wound is still open. At present I am concerned with infection before the operation. The simpler cases are those in which the infection is confined to the bladder. These are sometimes complicated by attacks of epididymitis. In old-standing cases a very heavy infection may remain localised to the bladder and have no general toxic effect on the patient. The more complicated cases have pyelitis or pyelonephritis in addition to the cystitis. In the latter cases there are recurring attacks of fever, and eventually the patient drifts into the condition known as urinary septicæmia, a combination of bacterial toxæmia and uræmia.

If the infection is recent and moderate, and there is no evidence of renal involvement, a few weeks' preparation by thorough bladder washing and removal of the residual urine, either by intermittent catheterisation or by the resident catheter, together with diuresis and urinary antiseptics, will suffice as a preparation for the removal of the prostate. When a more severe grade of sepsis is present it will be necessary to perform suprapubic cystotomy and drain the bladder. This is prostatectomy in two stages, and I shall refer to the two-stage operation later. The question that I wish to discuss at present is the selection of cases for prostatectomy where sepsis is present and has been treated. In the mild cases, when the infection has been confined to the lower urinary tract, there is no difficulty. Some extra care in regard to irrigation after the operation will be necessary in such cases. Where the infection has been severe the decision is a more difficult one. When the sepsis has been confined to the bladder it usually clears up quickly as the result of drainage and constant irrigation. When pyelitis and pyelonephritis are present the general condition of the patient will usually improve with bladder drainage, and the question of prostatectomy will have to be faced.

The tests that can be applied to such a patient, and their value, may be considered under the following headings: (1) general condition of the patient; (2) condition of the urine; (3) renal function tests; and (4) cholesterol content of blood.

The first two of these headings I need not discuss further. The renal function tests have been used to decide the question of prostatectomy in these cases, but do no more than indicate the secretory activity of the kidneys at the time of the test. Although in the later stages of bilateral pyelonephritis the renal function is profoundly altered, a kidney may be the seat of septic infection and yet maintain a high grade of functional activity. The danger in these septic cases, where prostatectomy still appears feasible, is that the operation will cause a flare up of the infection which is fatal, either by bacterial toxæmia or uræmia or both.

A method which promises greater accuracy is the estimation of the blood cholesterol. Cholesterol plays an important but as yet ill-defined part in the process of immunity, stimulating, it is believed, the production of antibodies. Macadam and Shiskin [10] have suggested that the cholesterol content of the blood should be used as a measure of the resistance to infection possessed by the individual. These investigators concluded that the cholesterol content of the blood was a fair measure of the degree of resistance to infection, and should form a useful guide to the degree of operation risk in cases of urinary obstruction. The normal average cholesterol content of the blood was stated at 0·161 per cent., with a range of 0·191 to 0·133 per cent. More recent observations by Gardner [11] extend the limits of the normal cholesterol content of the blood in health, this observer having found figures varying between 0·08 and 0·23 per cent. in normal adults. Maxwell [12] holds the view that probably each individual has a definite level somewhere within these limits, from which level there is very little variation in health. In disease it is possible for the cholesterol content to vary to quite a considerable degree before the figure transcends the normal limits laid down above. Thus the minor abnormalities may pass unnoticed. The blood cholesterol is liable to be affected by many external factors, all of which are not fully recognised. It is known to be increased in arterio-sclerosis, granular kidney, and other degenerative conditions of later life. In anæmia, especially where the red cell count falls below 50 per cent. of the normal, the cholesterol content is diminished (Macadam and Shiskin). In malignant disease high figures have been reported by Luden,[13] but the results of Brunton and of Maxwell in such cases were variable. In myxœdema, and still more in subacute parenchymatous nephritis, there is an increase in the blood cholesterol (Gardner and Gainsborough).[14]

In 18 cases with a blood cholesterol content less than 0·13 per cent., which Macadam and Shiskin held was the lowest normal limit, they found that 16 died of pyelonephritis after prostatectomy and two recovered. Maxwell had ten cases where the blood cholesterol was below 0·13 per cent., and three of them died of infection, and one of uræmia, while of 16 cases with a normal cholesterol content four died of infection and one of uræmia. Dr. R. D. Lawrence has carried out the test for me in a variety of diseases of the urinary organs. Among these there were 50 cases where the prostate was removed by suprapubic prostatectomy. There were ten cases where the cholesterol content of the blood was 0·13 g. per cent. or under. Of these, four died from the effects of sepsis (40 per cent.). On the other hand, there were a number of cases where the cholesterol content of the blood was within the normal figures, and epididymitis developed or the cystotomy wound healed slowly on account of sepsis. The average figure of the cholesterol content of the blood in seven cases where epididymitis followed prostatectomy was 0·129 g. per cent. In this group there was one case where the figure was 0·286 g. per cent., and another with a cholesterol content of 0·077 g. per 100 c.cm. The average cholesterol content of the blood in four cases of pyelitis and pyelonephritis following prostatectomy was 0·134 g. per cent. Rapid healing of the cystotomy wound followed operation in 15 cases, with an average cholesterol content of the blood of 0·17 g. per cent.; slow healing from sepsis in nine cases with an average cholesterol content of 0·141 g. per cent.

It would seem, therefore, that on the average the cholesterol tends to run in high figures where rapid healing takes place, and in low figures where the healing is delayed by sepsis. But there are individual cases that completely upset the clinical application of these figures. The question that the surgeon has to face in regard to such a test is, can he make the important decision as to whether an operation should or should not be performed from the figure of the cholesterol content of the blood? My view is that he cannot do so at the present time, and much careful work is required before this test of the resistance to sepsis is brought up to the level of reliability that the urea content of the blood or the urea-concentration tests have reached in relation to renal efficiency.

Circulatory Risks.

A large proportion of the patients that are submitted to prostatectomy show signs of arterio-sclerosis, a few have valvular disease, and some have impairment of the myocardium. The degree of circulatory strain that is permissible in any given case will be decided by the physician and the anæsthetist. Some of the cases in this series run very grave circulatory risks from the condition of the heart, as well as from the state of the blood pressure. Here I will merely make some general remarks on the surgical aspect of high and low blood pressure in prostatectomy.

The first point is that a large number of the patients submitted to prostatectomy have a low blood pressure, and a considerable number have a very low pressure. Thus in 107 consecutive cases 44, or 41·1 per cent., had a systolic pressure of 140 mm. of mercury or under, and 19, or 17·7 per cent., had a systolic pressure of 120 or under. This is contrary to what one would expect, for the average age of these patients was 67 years. It is certainly against the view held by some that senile enlargement of the prostate is always accompanied by arterio-sclerosis. If we look at the other end of the scale there were a number of cases where the systolic blood pressure was very high. In 15 the pressure was 200 and over, and it rose to 230 in two, 250 in two, and 260 in one case. In 24 (22·4 per cent.) the pressure was over 180.

With a very high blood pressure one would expect a large number of cases of serious hæmorrhage, yet in 15 cases with a systolic pressure of over 200 there were only two cases (13·3 per cent.) of severe post-operative hæmorrhage, and no cases in which the hæmorrhage at the time of the operation was serious. In the low grade pressures of 120 or under there was more severe hæmorrhage—namely, four cases of severe hæmorrhage at the time of operation (21·0 per cent.), and two cases of post-operative hæmorrhage (10·5 per cent.). Thus, taking all the cases of hæmorrhage, there were six in 19 (31·5 per cent.) at a pressure of 120 or under, and two in 15 (13·3 per cent.) at a pressure of 200 or over. In none of these cases did hæmorrhage decide a fatal issue. The occurrence of thrombosis in a proportion of cases of very low blood pressure, where the patient is immobilised in bed for a period of time, seems almost inevitable. When a septic focus lies in close relation to and practically in direct communication with a large plexus of veins, such as the prostatic plexus, clotting becomes almost a certainty.

Examined in this light we find that the lower the blood pressure the greater the probability of thrombosis and of pulmonary embolism. In 19 cases where the blood pressure was 120 and under there were three cases of thrombosis of pelvic or cerebral veins, and two cases of pulmonary embolism (26·3 per cent.), while in the remaining 88 cases of the blood pressure

series there were only two cases of thrombosis (2·2 per cent.). Only one case in the whole series died of sudden cardiac failure (systolic pressure 200).

My experience in regard to the various grades of blood pressure leads me to fear the low blood pressure patient on account of the danger of thrombosis and pulmonary embolism. The death-rate from pulmonary embolism is a serious one, and there are numerous cases of smaller emboli that recover. In the prevention of pulmonary embolism the prevention and treatment of sepsis has the first place, and next come measures which have for their object the prevention of stagnation in the pelvic veins. So far as is compatible with safety from hæmorrhage, patients with low blood pressure are kept on stimulants. They are encouraged to move the limbs and gentle massage is given. Deep breathing exercises are practised daily. The prevention of coagulation by means of citrates or other drugs is of doubtful value.

Mental and Nervous Disease.

A mild delirium becoming more evident at night and some mental confusion is not very uncommon in patients in the advanced stages of prostatic obstruction from enlargement of the prostate gland. The condition is partly due to uræmia and partly due to loss of sleep and rest from constant bladder irritation. Where adequate preliminary treatment by drainage, diuresis, and diet is carried out these patients usually do well after the operation of prostatectomy. In some cases the delirium reappears and becomes more active and the patient more and more difficult to nurse and control, food is refused, and there is great restlessness and desire to get out of bed; occasionally the patient becomes violent and difficult to restrain. These patients frequently become exhausted from their struggles, and from want of nourishment and fluids, and die. Suprapubic cystotomy is probably the best treatment for them and prostatectomy should be deferred sometimes for several months. Such cases are not confined to prostatectomy, although the factors that produce the condition are frequently combined in the cases in which prostatectomy is performed—namely, the presence of a mild chronic toxæmia in an old and rather feeble subject.

Another type of post-operative delirium amounting almost to mania occurs without preoperative warning and without the presence of toxæmia. Here the patient becomes quite uncontrollable after the operation, sedatives having little, or at least short-lived, effect. The condition may settle down after a few days when the patient is exhausted and heavily drugged. Such patients often die of some intercurrent complication.

Another type is met with where a patient suffering from increasing mental irritation and confusion has the symptoms of enlargement of the prostate with an adequate renal function and no urinary infection. The prostate is regarded as a source of irritation and its removal suggested. I have operated on two such cases without in any way improving the condition of the patients, who gradually sank and died some weeks after the prostatectomy.

Disease of the Spinal Cord.

It would seem an easy matter to distinguish between the bladder atony of disease of the spinal cord and the obstruction of an enlarged prostate, yet mistakes do sometimes occur in cases of early or arrested tabes dorsalis. Cases of disease of the spinal cord are not infrequently met with when the most prominent group of symptoms are those relating to the bladder. In such cases careful examination will usually reveal some symptom that points to nervous disease. All doubtful cases should be submitted to the neurologist for investigation.

There is another group of cases that give rise to difficulty in diagnosis. These I have described as "atony of the bladder without obstruction or symptoms of nervous disease." Such cases of idiopathic atony are now fully recognised. The diagnosis is difficult and necessitates the exclusion of early disease of the spinal cord and of minor changes in the prostate at the neck of the bladder. For fuller information in regard to these cases I would refer those interested to my original article[15] and to an exhaustive article by Braasch.[16]

The patient who suffers from tabes dorsalis may develop enlargement of the prostate gland. It is a matter of some difficulty to estimate whether the residual urine is due to obstruction or to atony. The bladder symptoms may be due to the enlarged prostate and the bladder, relieved of the obstruction by prostatectomy, may resume its normal function; on the other hand, the removal of the prostate may leave the patient with an atonic bladder due to the disease of the cord and a urethra through which it is difficult to pass a catheter. The diagnosis between prostatic obstruction and nerve atony of the bladder in a case of tabes dorsalis will rest upon the following points.

(1) Absence of or diminished desire for micturition.
(2) Impairment of sensation in the prostatic urethra.
(3) Spasmodic contraction of the compressor urethra.
(4) Relaxation of the internal meatus from atony of the internal sphincter seen by cystoscope and urethroscope.
(5) Fine trabeculation and sacculation of the bladder wall on cystoscopy.
(6) General sacculation of the bladder wall and funnel-shaped bladder neck and prostatic urethra on cystography.

I have operated on three cases of enlargement of the prostatic gland in patients suffering from tabes dorsalis, and have been fortunate in each case in obtaining as good a result as if the nervous system were normal.

Glycosuria.

Prostatectomy has shared with other operations the benefit of modern progress in medicine, and glycosuria, which at one time was regarded as a contra-indication to prostatectomy, is now only a cause of delay. Diabetes is a disease of a rather earlier period of life than enlargement of the prostate and the point has been discussed whether senile glycosuria is the same as ordinary diabetes. Graham[17] and Lawrence[18] consider that the two conditions are identical, but MacLean[19] inclines to the view that there is some unproved but essential difference between the two types. So far as prostatectomy is concerned, no distinction can be drawn. The evil effects of diabetes are particularly dangerous in the subject of enlarged prostate who undergoes prostatectomy. The two dangers are coma and infection and sloughing of the wound with delay in healing, and the latter may be the cause of death from chronic sepsis many weeks after the operation. Before the introduction of insulin it was occasionally possible to obtain a successful result from prostatectomy in a case of glycosuria, and I have treated two striking examples. I have notes of 16 cases of glycosuria on which I performed prostatectomy. Of these, 12 (75 per cent.) recovered from the operation and four died (25 per cent.). Of the four fatal cases, two died of diabetic coma within three days of the operation. These cases were operated before the modern advance in the treatment of diabetes was made. One patient died of pyelonephritis 21 days after, and the other of pneumonia on the thirty-second day after operation. The wound in this case healed rapidly, the bladder being closed on the twenty-third day. Of the 12 cases that recovered, six healed rapidly and four healed slowly. The rapidly healing cases were those that were treated by modern methods; only two of these healed slowly. The reduced resistance to bacterial invasion in these diabetic cases was shown not only by the delay in healing in some of the cases but also by the liability to septic complications such as cystitis, pyelitis, pyelonephritis, and epididymitis. Further, if sepsis became established, it appeared more difficult to overcome in these diabetic cases than in the average non-diabetic patient. The difference in the safety with which operation can be undertaken and the rapidity with which the wounds

heal in cases of glycosuria treated under modern conditions compared with those operated before insulin was introduced is very striking. It is perhaps too much to say that under modern treatment cases of glycosuria cause no more anxiety than the average case of prostatectomy, but it is safe to state that from being almost a complete contra-indication to prostatectomy, glycosuria now only delays the operation and somewhat increases the risks.

Time for Operation.

It is generally accepted that the best form of treatment for the adenomatous prostate is removal by operation if no contra-indication exists in the urinary organs or other systems of the body. In the majority of cases seen by the surgeon no doubt will arise as to the necessity for operation. But where the prostate is moderately enlarged, and the symptoms are not severely disabling and the residual urine at no time exceeds 2 ounces and is sterile, the problem is a more difficult one. Is it wise to allow these cases to go on indefinitely or should the surgeon insist that operation should be done here as well as in the cases where the prostate is large and the residual urine abundant? Wherein lies the necessity for early operation? Does the growth of a prostate once definitely enlarged ever become arrested? My experience is that while the prostate may in some cases remain in a state of moderate enlargement for a number of years (five or six) without any appreciable increase in the size or the amount of obstruction as measured by the quantity of residual urine, the gland eventually enters on a period of more rapid enlargement with rapidly increasing residual urine. An accident such as a chill, holding the water too long, dietetic indiscretion, or fatigue, may precipitate the second stage by producing acute retention, after which the residual urine becomes permanently and progressively increased. But while the prostate may in its earlier stages remain apparently stationary for some years, the patient is growing older. What influence has the age factor on the seriousness of the operation of prostatectomy should it eventually become necessary? It is the experience of all urinary surgeons that the operation can be successfully performed in extreme old age. Freyer relates that in 1625 cases of prostatectomy he had operated on 92 octogenarians between 80 and 90 years, and 13 bordering on this age in their eightieth year with 12 deaths (11½ per cent.). This is a fine record of work, but the mortality here is twice that of his total average. In my own cases there were 27 patients of 80 years or over with three deaths, a death-rate of 11·11 per cent., which closely corresponds to Freyer's figures. Very constant skilled attention is necessary in these old men after operation. They may pass safely through an uncomplicated convalescence, but they have little chance of surviving an attack of bronchitis, an exacerbation of sepsis, or a severe hæmorrhage. In spite of the surprisingly moderate death-rate of prostatectomy in patients over 80 years, we cannot be indifferent to advancing age as an argument in favour of prostatectomy early rather than late.

Another point in favour of early operation is the "silent" prostate with chronic urinary retention. These cases are among the most difficult and dangerous to treat in prostatic surgery. The only way to prevent the development of so grave a complication is to examine thoroughly all cases of frequent micturition in old men and keep them under observation. If residual urine is found, operation should be recommended. Two further reasons why operation on an enlarged prostate should not be indefinitely delayed are the danger of sepsis and of malignant changes in a prostate which is the seat of simple enlargement.

Drainage of the Bladder.

Many of the complications of enlarged prostate that contra-indicate immediate prostatectomy and necessitate a period of preliminary treatment are of a purely medical nature. There are two groups of complications, however, that call for surgical treatment—namely, chronic retention of urine with consequent uræmia, and urinary sepsis. The treatment of these conditions leads to the discussion of preliminary drainage of the bladder either by catheter or by cystotomy. I shall consider the question in relation to four types of case commonly met with in practice.

(1) Chronic retention with symptoms of renal inefficiency.
(2) Severe urinary sepsis.
(3) Serious extra-urinary complications.
(4) Cases without serious back pressure or sepsis or extra-urinary complications.

1. *Cases of Chronic Retention with Symptoms of Renal Inefficiency.*—The danger of suddenly emptying a bladder containing a large quantity of residual urine in a patient suffering from enlarged prostate is universally recognised. The question that arises is what is the best method of emptying the chronically over-distended bladder? There are two methods—namely, the indwelling catheter and suprapubic cystotomy. The advantages of the resident catheter are that the fluid in the distended bladder can be withdrawn very slowly in measured quantities, that the suprapubic area, the field of the future prostatectomy incision, is untouched, that asepsis is more easily maintained, that the method is a much less severe one in debilitated and uræmic patients, and that only one cutting operation is performed. Suprapubic cystotomy is followed immediately by a rise in the blood-urea, whereas the tying-in of the catheter is not. The following two cases are extreme examples, but they serve to illustrate this difference between catheter drainage and suprapubic cystotomy.

Case 1.	Case 2.
Chronic retention.	Chronic retention.
No symptoms of uræmia.	Mild symptoms of uræmia.
Urea concentration 1·03 %.	Urea concentration 1·05 %.
Blood-urea 50 mg.*	Blood-urea 60 mg.*
Cystotomy.	Catheter drainage 14 days.
6th day: blood-urea 119 mg.*	14th day: urea concentration 1·4 %. Blood-urea 47 mg.*
8th „ „ 164 mg.*	Prostatectomy.
10th „ died, uræmia.	15th day after operation, wound dry.
	18th day after operation, home.

* Per 100 c.cm.

At the end of 10 or 14 days' continuous drainage the decision about prostatectomy will have to be made. If the renal function is satisfactory, and the general condition is good, it may be done, otherwise more prolonged drainage is necessary. If this drainage has been by indwelling catheter cystotomy will now be required, and will be maintained until the condition of the renal function is satisfactory. In 80 per cent. of cases where there is chronic retention, and signs of uræmia are present, the renal function has returned to normal or improved sufficiently for prostatectomy to be safe at the end of ten days' catheter drainage.

2. *Cases of Enlarged Prostate and Serious Urinary Sepsis.*—Drainage of the bladder is imperative before the prostate is removed. In such cases the retained urethral catheter is worthless, for the lumen is much too small to allow the free discharge of purulent urine. The only really effective method is suprapubic cystotomy, and the introduction of a large open tube. A catheter is tied in the urethra, and continuous irrigation is installed.

3. *Cases of Chronic Retention with Enlarged Prostate* where the patient suffers from a serious complication, such as severe bronchitis or pneumonia, and in which catheter drainage is difficult and suprapubic drainage is preferable.

4. *Cases with Enlarged Prostate Without Chronic Retention of Urine or Serious Urinary Sepsis.*

It has been the custom with some surgeons, especially in France and America, to divide the operation of suprapubic prostatectomy into two stages in all cases, and the two-stage operation has been

adopted in some surgical centres in this country. The advantages claimed for the two-stage operation are that there is less shock, less hæmorrhage, and less sepsis, and that the back pressure on the kidneys is relieved. In the ordinary straightforward case the two-stage operation does not appear to me to be safer than the one-stage operation. Shock is not a factor in uncomplicated one-stage prostatectomy. My experience has been that the second stage of a two-stage prostatectomy is much more likely to produce shock than a single-stage operation. If the open operation is performed where cystotomy has been previously done it becomes necessary to dissect away the whole of the scar tissue and to mobilise the bladder. The operation is, therefore, much more serious than a single-stage one. Hæmorrhage is not less in a two-stage than in a one-stage operation. There is no question of sepsis being reduced in the cases now under discussion, for the bladder is aseptic. In the two-stage prostatectomy the bladder practically always becomes infected during the period of drainage before the prostatectomy. If one accepts infection as a necessary sequel to prostatectomy, the two-stage operation has the advantage that the preliminary stage of infection is passed through before the prostate is removed, and possibly some degree of immunity to sepsis may develop before the second operation. This is certainly a great advantage in hospital work where the post-operative treatment cannot be closely supervised by the surgeon or by permanent assistants. An important disadvantage in the two-stage operation is that there are two operations and two anæsthetics, and that the total period during which the patient remains in bed is longer.

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RADIUM FOR JERSEY.—A public subscription, which has yielded £2611, plus interest, has been raised in Jersey in thanksgiving for the King's recovery. The money has been made over to the States (the Parliament of the island) for the purchase of radium and the creation of a radium clinic. The radium is to be kept at the General Hospital, and is to be available for issue to all practitioners in the island under regulations to be drawn up by the States General Hospital committee.

COÖPTED HOSPITAL REPRESENTATIVES.—The constitution of the public assistance committee of the Warwickshire County Council does not permit of the coöption of persons who are not members of the council. The executive committee of the Rugby Association of Hospital Contributors has decided to protest against this arrangement on the ground that the Hospital of St. Cross in that town, which serves a population of 40,000, ought to be represented on the committee, especially in view of the committee's statutory power to coöpt up to one-third of its number. The protest is to be sent to the Minister of Health, and other voluntary hospitals are to be asked to join in it.

THE TREATMENT OF CHRONIC ENCEPHALITIC PARKINSONISM WITH DRIED PREPARATIONS OF STRAMONIUM.

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IN the investigation of different forms of treatment likely to benefit chronic encephalitic parkinsonism, it soon becomes apparent that no actual curative effect is possible. The symptoms and signs presented result almost entirely from neuronal destruction, and although it is possible that in some cases the severity of the condition may be increased by toxic depression of neurones owing to the presence of an active infection in the brain, there is little doubt that the progressive changes exhibited by most chronic cases are due to the destructive effects of such an active infective process. In these cases the attempt to find some means of eradicating the chronically active infection is logical, but even if such a method were forthcoming the most that could be expected would be that the progressive changes were arrested or that the risk of acute recurrences was removed. The treatment of the parkinsonian syndrome, therefore, resolves itself into what is essentially palliative treatment under which the patient has permanently to remain to avoid relapse.

Palliative Treatment of Chronic Encephalitic Parkinsonism with the Atropine Group of Alkaloids.

In 1906 Erb [1] recorded the value of hyoscine as a specific palliative in the treatment of idiopathic paralysis agitans. Owing to the close clinical similarity between this disease and chronic encephalitic parkinsonism, it is natural that hyoscine and its related alkaloids were early tried in the latter condition. In 1921 Babinski and Souques [2] drew attention to the value of hyoscine in encephalitic parkinsonism, and this observation soon received general confirmation. Other alkaloids related to hyoscine were also found to exert similar beneficial effects in varying degrees, and the application of this class of drugs has since become the established treatment. It was found that the muscular rigidity diminished, tremor lessened, sialorrhœa reduced, and that the patients became less helpless and more active in movement. These beneficial effects, however, speedily disappeared if the drug was omitted. Hyoscine hydrobromide appeared the most effective, and is now the substance most generally used. It is administered orally or hypodermically, but the benefit conferred is much greater when it is given by the latter route. It has been our object in the work recorded in this communication to find a palliative treatment of chronic encephalitic parkinsonism that is equally or more effective than the hypodermic administration of hyoscine but in which the drug can be given by the mouth so that patients may receive the maximum benefit without admission to hospital, or the irksome routine of at least three hypodermic injections daily. At the stage to which the investigation has now progressed, it has been found that this result is best obtained by the use of dry preparations, and particularly the dried extract of stramonium in suitable doses.

Treatment with Stramonium.

In 1925 Juster [3] described the value of stramonium in diminishing parkinsonian rigidity, and in 1926 Laignal-Levastine and Valance [4] reported the results of a year's treatment with stramonium in 24 cases of parkinsonism. These observers found in their cases amelioration of the muscular rigidity, bradykinesia, salivation, and tremor, and the state of mental inertia—bradyphrenia—was improved. Other favourable reports on treatment with stramonium were made in 1928 by Shapiro [5] and in the same year by Carmichael and Green.[6] The latter observers used tincture of stramonium, B.P., in doses which they succeeded in raising to 90 minims three times a day, and they stated that the optimum dose was 45 to 60 minims by the mouth. Carmichael and Green's conclusion, which we are unable to confirm, was that tincture of stramonium in these doses was quite as effective in palliating parkinsonism as hyoscine administered hypodermically. In 1928 Shapiro [5] also reported on the effects of stramonium given by Juster's method—viz., the oral administration of the powdered dried leaves of *Datura stramonium*. The dried leaves were first given in doses of gr. 1 three times a day, and this dose was rapidly increased until grs. 14–16 were being taken daily. When the optimum effect was reached the dose was diminished until grs. 7–8 were given daily. Of the 23 cases treated without ill-effects 16 were suffering from encephalitic parkinsonism and 7 from senile paralysis agitans. The results in 14 cases (11 of encephalitic parkinsonism and three of paralysis agitans) were reported as excellent. In the remaining nine cases improvement was slow. The degree of benefit was greater in the encephalitic patients than in those suffering from paralysis agitans, a result that we can fully confirm. Muscular rigidity, speech, gait, sialorrhœa, and mental condition were all favourably influenced. Occasionally slight diarrhœa and some mydriasis occurred but were satisfactorily relieved by omitting the drug for a day or two. Finally, in 1929, Jacobsen and Epplen [7] commented upon the action of tincture of stramonium, U.S.P., and summarised the treatment of parkinsonism with stramonium.

Personal Experiments with Stramonium.

1. *Tincture of Stramonium.*—Six typical cases of chronic encephalitic parkinsonism were treated, originally with tincture of stramonium, B.P., given three times a day. The patients began with doses of 20–30 minims, t.d.s., and these were rapidly increased to 90–120 minims, t.d.s., that is, up to as much as eight times the maximum pharmacopœial dose. Definite improvement resulted in the muscular rigidity and bradykinesia in all cases, and the result was distinctly better than that obtained from hyoscine gr. 1/200–1/100 t.d.s., given by the mouth in tablet form. The benefit from tincture of stramonium in the doses mentioned, however, was not nearly so great as that resulting from gr. 1/200–1/100 of hyoscine given hypodermically. The patients continued treatment with the stramonium tincture over a period of two years and at no time were any signs of intolerance exhibited.

2. *Dried Stramonium Leaves.*—A series of 12 cases, all of whom had previously been under the hypodermic hyoscine, were then treated by Juster's method with the exception that his recommendations as to dosage were not strictly followed. The dried leaves of *Datura stramonium* were given in capsules or pills three times a day, the initial dose being either 0·1 or 0·2 g. t.d.s. This dose was found to be too small to produce benefit and was therefore increased by the addition of 0·1 g. to each dose until the patients were receiving 1·2 to 1·6 g. three times a day. At this point some of the cases showed intolerance in the form of mild delirium of short duration. Nevertheless, this level of dosage was maintained for three months, and during that period the condition of the 12 patients was equal, and in some instances superior, to that previously produced in the same patients by the hypodermic administration of hyoscine in maximum doses—i.e., the highest doses that could be tolerated being in no case less than gr. 1/100 t.d.s.

All the cases treated were classified as severe. When not under treatment they were all quite helpless, exhibiting pronounced generalised parkinsonian rigidity and, in most instances, inability to stand or walk, to feed themselves, or to dress and undress. All showed much limitation and indistinctness of speech and excessive salivation. Striatal tremors and greasy skins were common. During the period of treatment with maximum doses of dried stramonium leaves their muscular rigidity was much reduced, often practically abolished. They were able to stand and also to walk; in fact, in most cases walking became quite free. The general bradykinesia and helplessness was much diminished and all patients could feed themselves, talk well, dress, and undress. Nine became fully capable of looking after themselves and of doing a considerable amount of work, such as sweeping and tidying the wards. Several appeared almost physically normal. Bradyphrenia was much improved, sialorrhœa abolished, and tremor somewhat diminished. We estimated that the clinical effect, as regards benefit, of 1 g. of dried stramonium leaves was approximately equal to that produced by gr. 1/100 of hyoscine hydrobromide given hypodermically.

3. *Dried Extract of Stramonium.*—The dried stramonium leaves were given in capsules and pills, and also in powder form. In the larger doses reached, however, the amount required became unreasonably bulky; consequently a dried preparation of stramonium leaves containing a higher percentage of total alkaloids was given, so that a proportionately smaller dose would produce the same effects. The preparation was the extractum stramonii of the United States Pharmacopœia, which is manufactured from the dried leaves by percolation with alcohol, evaporation of the percolate to a pilular consistence, and adjustment of the strength so that the extract contains 1 per cent. of total alkaloids. The alkaloidal content of dried stramonium leaves varies from 0·1 to 0·7 per cent., the average being 0·25 per cent.; the dried extract, therefore, was approximately four times as strong as the dried leaves. Extractum stramonii, U.S.P., was preferred to the B.P.C. extract, as the latter is a coarser powder and is said to be more deliquescent.

The 12 patients under treatment with dried stramonium leaves were then transferred to treatment with extractum stramonii, U.S.P., the doses administered being one-quarter by weight of those of the dried leaves. Thus the initial doses with the extract of stramonium were 0·25 to 0·375 g., three times a day by the mouth. The transference was made at once in all cases, and the smaller bulk of the extract was found to be far more acceptable than the larger one of dried leaves. The substitution proved to be perfect, the great improvement in the condition of each patient being fully maintained.

Dried stramonium leaves in doses of 1 g. t.d.s. produced a clinical effect equal to that of maximum doses of hyoscine given hypodermically three times a day. The average maximum dose of the latter in the 12 patients was gr. 1/100 t.d.s. Thus it was concluded that, as regards clinical effect, the potency of gr. 1/100 hyoscine was approximately equal to 1 g. of dried stramonium leaves, and, therefore, to 0·25 g. of extract of stramonium. A series of 53 cases of encephalitic parkinsonism under treatment with hyoscine gr. 1/200 to gr. 1/100 hypodermically three times a day were then transferred directly to treatment with extract of stramonium, U.S.P., in the calculated equivalent doses. In severe cases it was found that if the hyoscine were suddenly omitted the patients rapidly relapsed into a state of helplessness and had difficulty in swallowing the stramonium extract. In addition, in some cases, the absorption of the stramonium extract and the conse-

quent exertion of its full effect was slower than the elimination of the hyoscine, with the result that the patient relapsed. To avoid this, therefore, the substitution was carried out in stages. Each dose of hyoscine was reduced by gr. 1/200 and 0·125 g. of stramonium extract given instead. A day or two later a further gr. 1/200 of hyoscine was replaced by the equivalent amount of stramonium (0·125 g.). Consequently the patient was then receiving 0·25 g. of stramonium extract instead of gr. 1/100. of hyoscine. This was continued until complete substitution had taken place. In some cases it was found necessary to carry out the substitution even more slowly.

Case Results.

This series of 53 cases, together with the 12 cases originally treated with dried stramonium leaves as described above and, in addition, with 15 further cases who were receiving hyoscine by mouth as out-patients, making a total of 80 cases, have now been treated with extractum stramonii, U.S.P. The ages of the patients range between 12 and 40 years, the majority being over 16. The 80 cases have continued on the extract for the past six months and all the patients that had previously been receiving maximum doses of hyoscine hypodermically have remained quite as well as they were on the latter and in many instances are even improved. It was found possible quite rapidly to increase the amounts of extractum stramonii that were given at first, and at the present time the average dose in a moderately severe case of generalised parkinsonism is 0·75 g. three times a day by the mouth. Many of the patients are in a satisfactory condition on 0·5 g. three times a day, while one or two cases are receiving doses of more than 1 g., the largest being 1·375 g. three times a day. The case on the latter dose is an extremely severe one; he has been utterly helpless for over four years, with greatly impaired speech, inability to feed or dress himself, to stand or to walk, and with much bradyphrenia. On the heavy dosage mentioned he can walk slowly by himself, can talk well, feed himself, and is much brighter mentally. His case illustrates the increase in tolerance of the atropine group of alkaloids that is associated with parkinsonism; the greater the severity of the syndrome the greater the tolerance. In this series of 80 cases the improvement is present in all features of the syndrome. It occurred to the same degree in the original series of 12 cases—i.e., most of the patients previously helpless become able fully to look after themselves, capable of much physical work and activity, and mentally brighter. Muscular rigidity is the symptom most relieved and in many cases is totally abolished; sialorrhœa and greasiness of the skin also disappear. Bradykinesia and bradyphrenia are much ameliorated; tremor, although not abolished, is mitigated; speech is fluent and comparatively easy; standing and walking are not only possible and almost normal in many cases, but the extreme flexion of limbs, trunk, and neck is considerably diminished in most of the patients. The improvement is such that many cases are able to look after themselves quite satisfactorily in the outside world, although probably few of them would be capable of earning their living. We have tried the stramonium extract in several cases of idiopathic paralysis agitans, but we find the relief of symptoms and especially of tremor is considerably less than in encephalitic parkinsonism.

The Relative Failure of the Tincture.

Having obtained such satisfactory results with dried preparations of stramonium, it was interesting to inquire why tincture of stramonium was less successful. It has been stated above that extractum stramonii, U.S.P., is prepared from the dried leaves and standardised to contain 1 per cent. of total alkaloids. Tinctura stramonii, B.P., is also made from the dried leaves by percolation with alcohol in a similar manner to the extract. Thus, the tincture should contain the same alkaloids and any other constituents as the extract, and should be capable of producing identical pharmacological effects. It was found, however, after calculation, that the average content of total alkaloids in the tincture was only 0·05 per cent. Thus tinctura stramonii, B.P., is 20 times weaker than extractum stramonii, U.S.P. To prove this conclusion clinically, several patients who were being treated with dried preparations of stramonium had an equivalent amount of tincture substituted. Patients receiving 0·25 g. of extractum stramonii, t.d.s., had this withdrawn and were given tinctura stramonii, B.P., ℥ iii. t.d.s., instead. Their condition remained exactly the same as when receiving the extract. When the dosage of tincture was appreciably reduced the patients relapsed and when it was appreciably increased they showed signs of intolerance similar to those exhibited when their dosage of extract was increased. The theoretical calculation of equivalent doses was therefore borne out in practice. Similar substitution was successfully carried out in cases receiving hyoscine and dried leaves on the basis of the equations: hyoscine gr. 1/100 = dried stramonium leaves 1 g., extractum stramonii, U.S.P., 0·25 g. = tinctura stramonii, B.P., ℥ iii. Other workers with tinctura stramonii have not reported the employment of such large doses, and the small benefit that we obtained from exhibiting the doses that they recommended is explained by the fact that, on the basis of the above experiments, they were administering doses that were much too small.

We find that extractum stramonii, U.S.P., is preferable to tinctura stramonii, B.P., because, firstly, the administration of adequate doses of the tincture entails the daily consumption of a certain amount of alcohol, and, secondly, the tincture is twice as expensive as the extract. Extractum stramonii exsiccatum, B.P.C., is of exactly the same strength as the U.S.P. extract, but is a coarser powder and is said to be more deliquescent. We have tested it in several cases, however, and find that it produces the same clinical benefit as the U.S.P. extract; it can be used, therefore, in the same doses as the latter.

No deleterious effects result from the prolonged administration of stramonium nor, indeed, from any of the atropine group of alkaloids and there is no cumulative action. Owing to the exceptional tolerance of these alkaloids shown by parkinsonian cases, overdosage is not easy to produce and is rarely serious. Acquired increase of tolerance occurs, but its development is slow and a patient normally persists for many months in a satisfactory condition on doses such as those mentioned above. Two principles in the palliative treatment of parkinsonism are important: (1) the maximum dosage should rapidly be found, and (2) the dosage should be maintained continuously for the rest of the patient's life.

Pharmacological Action of the Atropine Group of Alkaloids.

The mode of action of the atropine group of alkaloids in specifically ameliorating parkinsonism is somewhat obscure. Is the action central or peripheral? These substances are known to act peripherally on the parasympathetic nervous system, giving rise, for example, to paralysis of the nerve-endings of the secretory fibres to the salivary glands, of the fibres to the sphincter pupillæ and of the vagus nerve. Also, they depress the nerve-endings of the secretory fibres to the sweat glands throughout the body and, as most authorities agree that these fibres originate from the sympathetic nervous system rather than from the parasympathetic, this action would suggest some effect upon sympathetic nerve-endings. In experimental animals there is evidence of slight depression of ordinary sensory and motor nerves. Consequently, it may be said that this group of alkaloids tends to paralyse all nerve-endings, the effect being most marked upon those of the parasympathetic system.

These alkaloids are also known to act centrally, atropine producing general cerebral stimulation with a

subsequent depression, which is evident after large doses, when drowsiness and coma may supervene. Hyoscine produces a very short period of cerebral stimulation and the stage of depression is more pronounced. The action of hyoscine on nerve-endings is more powerful but passes off sooner than that of atropine. Hyoscyamine is isomeric with atropine, which is optically inactive and composed of equal quantities of lævo- and dextro-rotatory hyoscyamine. As the latter substance is said to be comparatively inactive, the effects of atropine are due to lævo-rotatory hyoscyamine. Thus, a given weight of atropine is only half as active as the same amount of hyoscyamine. The degrees of central action of the three alkaloids are grouped as follows:—

—	Atropine.	Hyoscyamine.	Hyoscine.
Stimulation ..	Marked.	Moderate.	Slight.
Depression ..	Slight.	,,	Marked.

Theoretically, hyoscyamine (that used in medicine being the pure lævo-rotatory form) should be twice as stimulant to the central nervous systems, as atropine, yet it is given as being less stimulant. If this is so, it may be possible that much of the deliriant action of the atropine is due to the 50 per. cent of dextro-hyoscyamine contained in it. The latter is a stimulant to the central nervous system in animals. *Datura stramonium* is said to contain chiefly hyoscyamine together with a little atropine and hyoscine; its action, therefore, should be mainly that of hyoscyamine. It has been suggested, however, that *Datura stramonium* contains unknown alkaloids which may modify its action. Degrees of benefit in parkinsonism similar to those obtained from stramonium are not obtained from atropine or belladonna; our experience is that they are rather more toxic and less specific in their clinical effects.

According to the theory of dual innervation of muscle as elaborated by Hunter, postural muscle tone is said to be maintained by impulses passing down sympathetic nerve-fibres to skeletal muscles. On this hypothesis the tonic excess of muscle tone in parkinsonism, suggesting an excess of postural tone, is possibly diminished by a depressant action of the atropine group of alkaloids on sympathetic nerve-endings. The soundness of this theory, however, is in considerable doubt and there is sufficient clinical evidence to show that the action of these drugs is largely central. A number of the distinctive features of parkinsonism relieved by their use are certainly central in origin; for example, the bradyphrenia and the tremor. On the other hand, the diminution of sialorrhœa is almost certainly due to peripheral action. The difference in effectiveness of these drugs in encephalitic parkinsonism and in senile paralysis agitans is probably due to the fact that there are distant clinical differences in the two syndromes and that the pathological lesions are localised with the greatest intensity in the areas of the brain somewhat removed from one another. Thus in paralysis agitans the main incidence of neuronic degeneration is in the globus pallidus, while in encephalitic parkinsonism the destructive lesions are most extensive in the substantia nigra. Further, at the comparatively late age at which paralysis agitans occurs, there is probably less power of response on the part of the nervous system to the effect of the alkaloids than at the earlier age of most encephalitic cases.

"Positive" signs or symptoms in the nervous system, in Hughlings Jackson's sense, cannot be the immediate effects of a disease process producing structural loss. They must be due, if they are not the result of pathological irritation and stimulation of neurones, to a loss of inhibition by higher over lower centres. Thus in parkinsonism the hypertonus is probably due to destructive lesions involving an area of the brain of which the function is the inhibition of lower centres concerned with the central origination of postural muscle tone. It is suggested that the specific palliative effect of the atropine group of alkaloids on parkinsonian rigidity is due to a depression of those centres over which inhibition has been diminished by the disease process.[8] Cruchet demonstrated that hyoscine, whilst benefiting parkinsonian rigidity, had less effect on the bradykinesia. It is probable that muscular rigidity contributes only secondarily to general bradykinesia, which appears to be largely a negative sign in the Jacksonian sense. Thus the incomplete efficacy of the atropine group would be explained. The undoubted benefit in that state of instinctive and emotional depression in parkinsonism known as bradyphrenia is difficult to account for. Bradyphrenia is not present in paralysis agitans. It is possible that central disturbances of the autonomic nervous system (producing signs of thalamic depression) are the basis of the condition and that the action of the atropine group of alkaloids on this system may explain the beneficial effect. The blood calcium in bradyphrenia is abnormally low and the condition is usually associated with marked bradykinesia, the two conditions appearing to be related. Both are distinctly benefited by Collip's parathyroid extract when this is given hypodermically in addition to drugs of the atropine group.

Summary and Conclusions.

Results as satisfactory as those from hypodermic hyoscine are obtained by the administration of extractum stramonii, U.S.P., by the mouth in doses of 0·25 g. to 1 g. or more three times a day, the average dose being 0·75 g. Similar results are obtainable with doses containing equivalent quantities of alkaloid of extractum stramonii exsiccatum, B.P.C., dried stramonium leaves, and tinctura stramonii, B.P.

The disadvantage of dried stramonium leaves is the excessive bulk of adequate doses, and of tinctura stramonii that it is twice as expensive as the stramonium extract.

The equivalent therapeutic doses of the preparations are as follows: hyoscine gr. 1/100 (hypodermic) = dried stramonium leaves, 1 g. = extractum stramonii, U.S.P., 0·25 g. = extractum stramonii exsiccatum, B.P.C., 0·25 g. = tinctura stramonii, B.P., ℥iii.

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THE CANCER HOSPITAL, Brompton Road, S.W.—The annual report shows that last year 1162 patients were admitted, an increase of 189. There were 1557 new out-patients, and the 988 operations were an increase of 129. The electrotherapeutic department treated 177 new cases. Plans have been prepared for the new building which will cost £93,000; at present only £17,500 has been received. A larger supply of radium is badly needed.

CHEMIST'S CARE OF DRUGS.—At Brighton police-court on May 23rd a chemist was summoned for failing to keep drugs in a locked receptacle. A police officer found a cupboard containing morphia, cocaine, and tincture of opium in a cupboard in the shop, the padlock being broken. At the time of the officer's visit the chemist was out, and an unqualified assistant and an errand boy were in the shop and could have had access to the cupboard. A plea of guilty was entered on behalf of defendant, and it was stated that the padlock had worked properly on the day of the inspection by the officer, but before the officer entered it could not be opened and was forced. When the officer called the defendant had gone out to buy a new one. The justices, by a majority, fined the defendant £2.

CUTANEOUS PAPILLOMATA IN THE RAT FOLLOWING EXPOSURE TO ULTRA-VIOLET LIGHT.

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OF the theories which seek to explain the ætiology of cancer the only one which has received experimental proof is that which assigns the exciting rôle to chronic irritation. The forms of stimulation which are now known to cause cancer are, however, of a most diverse character, though the properties of the cancerous cell are similar in all cases. It therefore follows that whatever the forms of external stimulus, the metabolic changes in the tissues produced by these stimuli must of necessity be essentially similar. The nature of the metabolic changes set up by carcinogenic stimuli is, however, one of the essential points in connexion with cancer on which knowledge is still lacking, though work such as that of Lewis (1927) on the responses of the blood-vessels of the human skin to various forms of stimuli is highly suggestive of the type of investigation which must be carried out in order to throw light on this question.

In the meantime much can be learnt in regard to prophylaxis from a study of the external forms of stimulus which may give rise to cancer. Comparatively little attention has, however, been paid to the possibility of carcinogenic action by ultra-violet rays, though there is abundant clinical evidence to suggest that prolonged exposure to sunlight rich in ultra-violet light is a cause of skin cancer in man.

In certain parts of America, and more especially in Australia, there is a Northern European population exposed to prolonged and intense sunlight, with the result, as Molesworth (1927) points out, that rodent ulcer and epithelioma of the skin are far commoner in Australia than in Great Britain. In addition, white cattle in Australia are especially liable to develop epitheliomata. Drabble (1929), for instance, in New South Wales found 190 cases of skin cancer among 955,798 cattle slaughtered in four years. The colour incidence of the affected animals was of considerable interest, as in all cases the animals which were wholly or partly white showed evidence of chronic dermatitis on the unpigmented portions of the skin, and where malignant changes had occurred the areas of skin involved were also partly or wholly white except in three cases. In these three cases the growths had arisen from old brand-scars.

Of the 190 cases of epithelioma described, no less than 137, or 72·1 per cent. of the total, occurred in white or partly white cattle, and of the 30 roan-coloured cattle with skin cancer many were so lightly pigmented as to be approaching white. Only one black animal was affected.

Similar evidence is available from Queensland, where practical farmers have now abandoned the breeding of white cattle owing to their liability to develop cancer of the skin.

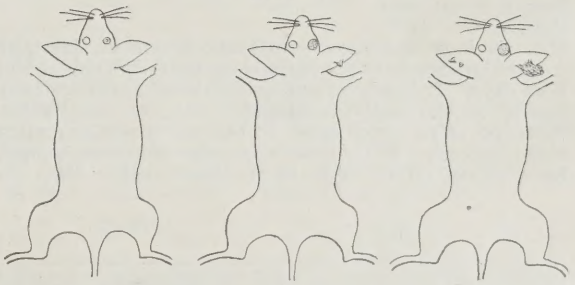
The parallelism with extreme liability to skin cancer of poorly pigmented persons, described by Molesworth from Australia, is very striking and strongly suggests that chronic dermatitis due to excessive exposure to sunlight rich in ultra-violet light plays a not unimportant part in the ætiology of skin cancer both in man and in cattle. Unfortunately, no particulars are available as to the length of time necessary to initiate these cancerous lesions in cattle. There is not wanting direct evidence to suggest that exposure to ultra-violet light from artificial sources may initiate precancerous and cancerous lesions in man. Colquhoun (1927) has reported a case of keratoses on the chest of a man treated with ultra-violet light, while Ferrari (1929) has recorded a skin tumour which developed after ultra-violet light treatment of an area of skin that had previously been the site of a radio-dermatitis.

Ultra-violet Light as a Cause of Skin Tumours in Rats.

In a previous communication (1928) I brought forward evidence to show that exposure to the rays of a mercury-vapour lamp is capable of exciting carcinomatous changes in the skin of the mouse, provided the exposures are continued for a period of at least eight months. Experiments have now been carried out to determine whether rats exposed to the mercury-vapour lamp are also liable to develop epitheliomata. Six albino rats, about six months old, were epilated with sodium sulphide on an area of the back and were exposed to the light of the mercury-vapour lamp at a distance of 18 inches for one minute three times a week.

The technical details of the lamp are similar to those reported in connexion with the experiments on mice. The rats were first exposed on Dec. 29th, 1927; 18 months later three rats were still alive and in apparently normal health. On July 25th, 1929, however, one of the two surviving rats was noticed to have a small greyish-white opacity on the cornea of the right eye. This opaque area gradually increased in size and at the same time the eyeball began to enlarge. On Sept. 6th, 1929, 616 days after the commencement of the experiment, a small papilloma was noticed on the dorsal surface of the right ear, and, though the exposures to ultra-violet light were abandoned, the papilloma grew rapidly into a large horny excrescence. About a month later, two tiny papillomata appeared on the dorsal surface of the left ear.

FIG. 1.



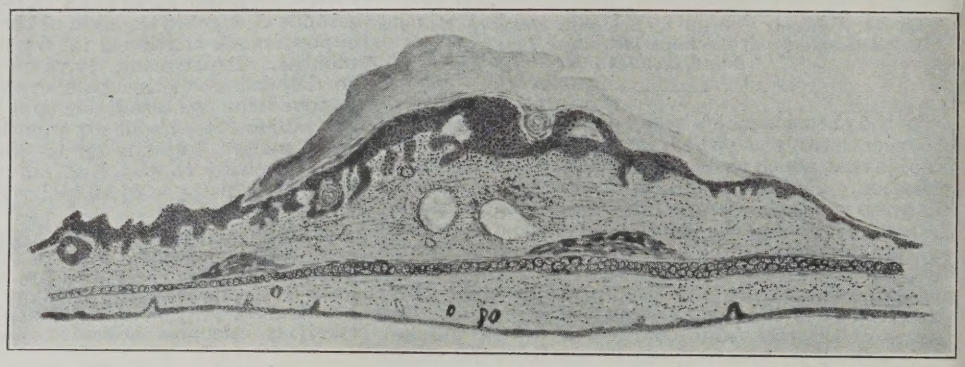
The development of multiple tumours in the rat following exposure to the mercury-vapour lamp.

Unfortunately the rat, which by this time was showing signs of senility, died on Nov. 13th, 1929, with bronchopneumonia. At the post-mortem the right eyeball was about three times the size of the left, while the cornea was uniformly opaque. The skin of the back, where epilation had been carried out, was entirely devoid of hair, although no depilatory had been used for some months; there was no evidence of tumour formation, the skin appearing smooth and atrophied. Microscopically the tumour on the right ear had all the appearances of a rapidly growing papilloma with cell-nest formation and much keratinisation; the cartilage of the ear was intact. The absence of infiltration and of metastases does not warrant a diagnosis of carcinoma in this case, although the rapid rate of growth, as shown in Fig. 1, strongly suggests that infiltration would have occurred had the animal lived. It is noticeable also that growth continued in the absence of further exposures to the mercury-vapour lamp. The right eye exhibited what may have been a sarcomatous condition of the conjunctiva but is more probably a chronic inflammatory lesion. The surface epithelium of the cornea was intact and of normal thickness at the periphery but had disappeared over the central part of the eye; the substantia propria was greatly thickened and consisted of a cellular fibrous tissue with mast cells and mitotic figures, while scattered throughout the tissue were numerous giant cells. Small capillary vessels were present throughout the growth. Sections stained for tubercle bacilli by Ziehl-Neelsen's method and for bacteria by toluidin-blue and van Gieson did not show the presence of micro-organisms.

Although exposure to the rays of the mercury-vapour lamp is thus undoubtedly capable of initiating precancerous and cancerous changes in the skin of

the mouse and rat, the question remains as to whether the ultra-violet rays are alone responsible or whether the infra-red rays given out by the lamp may also play some part in causing the cells to become malignant. Experiments with suitable screens are in progress to determine this question, but exposure of mice to a 1000-watt radiant heat bulb (glass) for 12 months has up to the present failed to induce malignant lesions in any of the exposed mice, while experiments with a thermopile show that under the conditions of the experiment the rise in temperature caused by the mercury-vapour lamp is not greater than 5° C. It is thus obvious that the carcinogenic action of the light from the mercury-vapour lamp is not attributable to the heat rays. It has been suggested also that the irritant action of the sodium sulphide may, in association with the ultra-violet rays, be the cause of the malignant change. If this were so, the tumours should have arisen on the skin of the back rather than on the ears, which had never been treated with the depilatory.

FIG. 3



Papilloma from left ear of rat (×18)—fixed formol saline, stained Weigert's hæmatoxylin and van Gieson.

FIG. 2.

Papilloma from right ear of rat (×9)—fixed formol saline, stained Weigert's hæmatoxylin and van Gieson.

The lesion produced in the cornea is of considerable interest. While the irritant effects on the eye of a single long exposure to ultra-violet light have received considerable attention (W. S. and P. M. Duke-Elder, 1929), the effect of frequent short exposures has not been intensively studied. Although the time at which the corneal lesion began is suggestive of a neoplastic condition, nevertheless the general appearances are more suggestive of a chronic inflammatory reaction than of a new growth. The question of differentiating between chronic inflammation and sarcoma is, however, one of the greatest difficulty.

The Time Factor.

A further point of interest is the time required to produce neoplastic changes in the skin of the rat and mouse respectively. In the latter animal the minimal period of exposure is eight months, in the former 21 months. This great increase in the time necessary for the induction of tumours in the rat by the mercury-vapour lamp is comparable with the time necessary to produce cancer in the same animal by means of tar. In the mouse, as is well known, a minimum period of about four months' tar-painting is necessary to induce skin cancer; in the rat a much longer period is required, for Russell (1922 and 1923), who was the first to produce sarcomata in the rat by the injection of tar, found that in one rat 11½ months and in a second 18 months was the necessary time. Very few skin carcinomata have been produced in the rat by tar. Herly (1926), however, reported the occurrence of one such tumour, but unfortunately it is difficult to estimate the time necessary for the induction of this tumour, as after 226 days tarring was suspended, to be resumed after an interval of five months. In certain unpublished experiments initiated by the late Dr. B. R. G. Russell and continued by myself, in which tar was injected subcutaneously once a week into the right flank of rats, a sarcoma appeared in one rat after 20 months, a skin carcinoma in another after 19 months, and a malignant adenocarcinoma of the breast in a third after 20 months.

The period necessary for the induction by tar of sarcomata and carcinomata in the rat is thus obviously much longer than in the mouse. In man the time necessary to produce cancer of the skin by means of tar is from 10 to 15 years, while at least 15 years is required for cancers due to exposure to sunlight.

It will be seen that the time necessary for the induction of malignant growth depends less on the irritant and the particular tissue involved than on

Animal species.	Time necessary for the induction of papillomata and carcinomata with—	
	Tar.	Mercury-vapour lamp.
Mouse ..	4–6 months.	8–10 months.
Rat	19 ,,	21 ,,
	Shale oil.	Sunlight.
Man	10–15 years.	15–20 years.

the species of animal. The time necessary for the production of cancer thus increases with the length of life of the species.

Conclusions.

By exposure to a source of ultra-violet light rapidly growing skin papillomata have been produced in a rat, together with a chronic inflammatory reaction in the cornea. The period (21 months) necessary for the induction of these skin tumours in the rat is longer than that required in the mouse; the time necessary to produce skin cancer in the rat by tar is also longer than that necessary in the mouse. It is, therefore, probable that the time required for the induction of cancer is dependent on the particular species involved rather than on the nature of the stimulus.

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GAS-OXYGEN AS A ROUTINE ANÆSTHETIC.

A SUMMARY OF TWO HUNDRED CASES.*

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FOR many years I have felt dissatisfied with both ether and chloroform as routine anæsthetic agents in general surgery. It is probable that many anæsthetists will object to my use of the word "routine," and I agree that one must approach individual cases with an open mind as to what will constitute the most suitable anæsthetic, having regard to such factors as age, type of patient, history of alcohol, and the condition of heart, lungs, and kidneys. Yet I think it must be admitted that in the British Isles generally ether is looked upon as the great stand-by, with chloroform second, gas-oxygen being used for exceptional cases only. When gas-oxygen is used it is more often than not passed through ether, and sometimes through chloroform also. This series of cases was carried out with a view to discovering to what extent gas-oxygen (pure) could displace ether and chloroform in a general surgical theatre.

My chief objections to chloroform and ether are, in both cases, the unpleasant induction and the disagreeable after-effects. There are various ways of minimising these effects, such as careful preparation, suitable premedication, and the use of ethyl-chloride for induction. No amount of care, however, can totally eliminate the unpleasant headache, nausea, and sometimes very distressing vomiting which follow their use, and which create such a bad effect upon the morale of the patient; every surgeon knows how the victims of multiple operations become resigned to anything that may be done to their bodies but grow more and more to hate and dread the anæsthetic. Personal experience of three operations under chloroform and ether went a long way to remove any lingering doubts which may have remained in my own mind of their unsuitability. I think it will be generally admitted that from the point of view of toxicity alone chloroform cannot be regarded as a suitable routine agent. Ether is safe "on the table" but, all other considerations apart, the high incidence of post-operative pulmonary complications makes some substitute highly desirable as a routine anæsthetic.[1]

I have long looked upon nitrous oxide, with its easy, pleasant induction and amazingly short recovery period, as the ideal agent, but difficulty in securing accurate dosage up to the time that I commenced this series prevented my adopting it personally or regarding it as a suitable all-round anæsthetic for general surgical purposes. My enthusiasm for gas-oxygen was first aroused when I saw it used by American anæsthetists during the war, but it subsequently received a check owing to the poor results obtained with the appliances in general use in this country—viz., various forms of the Boyle apparatus. This apparatus must be regarded as a very effective, all-round useful instrument, and there can be no doubt that with it, in its more perfected form, a very good anæsthetic can be given by using gas-oxygen-ether, with or without the addition of a little chloroform, but even in its latest pattern, as modified by Dr. Ross Mackenzie of Aberdeen, I do not regard it as a successful apparatus for pure gas-oxygen. When the apparatus is put into practical use one encounters several factors which make the administration difficult.

1. To ensure good anæsthesia the proportion of oxygen to gas must be capable of very fine adjustment, a difference of 2 to 3 per cent. in the mixture being sufficient to spoil a smooth course. The bubble system, controlled directly from the cylinder valves, is not sufficiently accurate, since nitrous oxide does not always flow in a smooth stream but is apt to come away in rather jerky fits and starts.

2. With this apparatus ether and chloroform, if they are to be used at all, must be used in quantities which spoil the effects of pure gas-oxygen. The reason for this is that with gas-oxygen alone, to ensure good relaxation in the majority of cases it is necessary at some stage of the operation to give a saturation of nitrous oxide which produces rather an unpleasant cyanosis. Most of us dislike the idea of giving even small amounts of ether to a patient with any degree of cyanosis, and to give chloroform at such a time is simply asking for trouble. Therefore, if one just fails to obtain relaxation with pure gas-oxygen (as usually happens with this apparatus) it is necessary first considerably to reduce the saturation of nitrous oxide, leaving a larger balance to be overcome with the additional anæsthetic.

3. The most complete relaxation is secured by what is called "secondary saturation," which is obtained by pushing the nitrous oxide to a stage just short of producing signs of distress and then quickly increasing the proportion of oxygen. This is a valuable method in difficult cases when, for example, the edges of peritoneum are about to be sutured, and by this means relaxation equal to that of full ether anæsthesia can be obtained. This process is only safe with a machine fitted with a safety-valve, a device for instantly shutting off the supply of gas and delivering pure oxygen under pressure or, better still, oxygen with a small percentage of carbon dioxide, which is a powerful respiratory stimulant.

The McKesson Apparatus.

A safety device for instantly inflating the lungs with oxygen is in my opinion a sine qua non for any apparatus designed to give gas-oxygen anæsthesia. Such an arrangement is unfortunately lacking in the standard Boyle. For the series of cases which I am about to summarise I selected and ultimately acquired for use in this theatre a McKesson (Model G) apparatus, which satisfies the essential features I have enumerated.

1. The mixture is independent of the flow from the cylinders, and the proportion, once set, remains constant.

2. The proportion of oxygen to nitrous oxide is capable of very fine adjustment.

* Read before the Forfarshire Medical Association.

[1] Fuller, C. J.: THE LANCET, 1930, i., 115.

3. In case of emergency the lungs can be instantly inflated with pure oxygen.
4. There is no need to be constantly turning taps on and off; when the patient breathes the gases flow; when he does not they stop automatically.
5. The machine is simple and easy to use.

A Series of Cases.

This series includes not only my own anæsthetics but a number given by Dr. W. H. Jeffrey, house surgeon to the unit. The first case was a woman aged 72 years, admitted with acute intestinal obstruction due to carcinoma of the descending colon, and complicated with very troublesome adhesions. The anæsthetic lasted 60 minutes and was a complete success, the patient waking up immediately the operation was finished in apparently better condition than when she arrived on the table. This good start was encouraging. From that date to the writing of this paper (approximately four months) the number of operations requiring anæsthesia in Mr. Alexander's theatre has been 315, classified as follows:—

Gas-oxygen	200
Ether and ether-chloroform mixtures	101
General ethyl chloride	3
Rectal (avertin)	2
Spinal	1
Local	8

The ratio of gas-oxygen to all other anæsthetics given concurrently with this series is, therefore, 200/115; but of these only the chloroform and ether are concerned in this summary. Of the 101 chloroform and ether cases, 24 were for face and mouth operations and endoscopic examinations; of the remainder, 59 were given by house surgeons from other units who were unfamiliar with the apparatus at times when I was not available and Dr. Jeffrey was assisting the surgeon. Thus within the unit there were only 28 cases in which gas-oxygen was abandoned in favour of ether and chloroform. This number includes 11 cases operated upon on days when, owing to transport difficulties, the supply of nitrous oxide failed, and two were children under six months to whom I preferred to give alcohol, chloroform and ether mixture. The remaining 15 operations were nearly all performed during the first half of this series before the potential capabilities of gas-oxygen were fully realised, the second half including only two, both of them operations involving extensive breaking down of adhesions and anastomosis for the elimination of fæcal fistula.

The 200 gas-oxygen cases may be classified as follows:—

1. *Upper abdominal.*—Gall-bladder, 9; perforated gastric and duodenal ulcer, 2; other gastric operations, 6; and laparotomies (various) involving the handling of upper abdominal organs, 15	32
2. *Lower abdominal.*—Appendicectomies including every laparotomy in which the appendix was removed, 60; and acute intestinal obstructions (various), 5	65
3. Kidney operations (lumbar)	5
4. Bladder and prostate	3
5. Radical amputation of breast	3
6. Thyroidectomy	1
7. Bone-plating and wiring	15
8. Hernia (various), varicocele, &c.	17
9. Anal and rectal	7
10. Empyema	4
11. Various	48
Total	200

Of these 200 cases nine required additional anæsthetic (ether or chloroform) to secure the necessary relaxation, as follows: gall-bladder cases (2); gastro-enterostomies (2); appendicectomies (2); herniæ (one strangulated) (2); bone-wiring (1).

The figures speak for themselves; they show that it is possible to anæsthetise a very wide range of cases, including high abdominal cases, with gas-oxygen alone. A critical inquiry must go further, however, and inquire whether the individual anæsthetics have been entirely successful both from the surgeon's point of view and that of the anæsthetist.

Success of the Anæsthetic.

There are three stages to be considered in connexion with the effects of any anæsthetic agent:—(1) the stage of induction; (2) the state of relaxation during the operation; (3) after-effects, both immediate and remote.

In this series the period of induction was found to last from three to ten minutes, with an average of five minutes; but even in cases where the patient "went away" quickly better results were obtained when the anæsthetic could be continued for fully ten minutes before commencing the operation. About half the cases passed through a definite stage of excitement, but, generally speaking, induction was quiet and characterised by absence of struggling. Robust alcoholic cases offered considerable resistance, but settled down, usually rather abruptly, in time. Recovery was rapid in every single case and was rarely accompanied by headache, nausea, or vomiting. A number complained of fuzziness or thickness of the head, which I attribute largely to the effects of the preliminary injection. It was most marked when hyoscine or atropine had been used. (At first patients received morphine sulphate gr. ¼, and either atropine sulphate or hyoscine hydrobromide gr. 1/100 for adults, and others in proportion. Latterly the atropine and hyoscine were stopped, with better results generally.) Vomiting, when it did occur, took place immediately and was slight, the ejected matter consisting of a frothy, clear fluid. The fact that on three occasions vomiting occurred simultaneously amongst a group of patients for whom the same cylinder had been used suggests impurities in the gas as a possible cause A few abdominal cases ejected bile after manipulation about the gall-bladder. In fully three-quarters of the cases recovery was so rapid that the patients had opened their eyes and were talking and answering questions or making jokes before leaving the theatre. The marked analgesic effect of nitrous oxide was frequently noted in patients who were allowed to come round before the last stitches or clips had been inserted, and who seemed to be unconcerned at what was being done, but occasional hyperæsthesia made it unsafe to let the patient round till the operation had been completed.

An interesting and rather instructive example of the rapid recovery from gas-oxygen was our own theatre sister, who had been trained in the wards to expect and deal with post-anæsthetic sickness. She awoke on the operating table after appendicectomy to treat with contempt and as a poor attempt at flippancy the statement that her operation was over and finished! She later wrote to another sister, "I have had the most wonderful anæsthetic with gas-oxygen; I could scarcely believe that I had been done, and had no sickness or felt anything afterwards except a little stiffness in my wound." Another example was a large powerfully built cattle-man who came up to the theatre from the out-patient department for removal of a bursa from the elbow. He had a strong alcoholic history and, indeed, warned us beforehand to secure him with a strap because during a previous anæsthetic he had fought and struggled so badly that it required two students and four nurses to hold him. He was given gas-oxygen (pure); induction lasted seven minutes, during which there was considerable fidgeting and muttering into the facepiece, but he suddenly settled down and remained quiet during the 20 minutes that the operation lasted. He had no sickness or bad after-effect, and when seen one hour later was fully dressed, feeling quite well, and anxious to get home in time for his dinner.

This series has demonstrated most markedly the overwhelming advantages of gas-oxygen during induction and after operation, the contrast in this respect with other anæsthetics being most noticeable and remarked upon by patients, ward sisters, and even probationers who found that they had less stained bed linen to wash. Remote effects were entirely absent, with one noticeable exception. This is a case which I find difficult to appraise.

The subject was a man aged 45, a butler, with an alcoholic history, toxic, suffering from duodenal ulcer for which he was having a second operation (gastro-enterostomy). Induction was not markedly difficult for the type, lasting seven minutes. There was cyanosis at the first incision, and it was found necessary to maintain a slight duskiness during the whole of the manipulative stage. The colour was deepened just before closure of the peritoneum, and good relaxation obtained at the time of suturing by increasing the percentage of oxygen, after which the patient remained a healthy pink. Recovery as usual was rapid, the patient answering questions before leaving the operating table, and remained uneventful during the next four days. There was no indication of chest trouble

until the fifth day, when slight dyspnœa was noticed. Death took place rather suddenly the same day and was attributed to massive collapse of the lung. Permission for a post-mortem examination was not obtained. Just what part gas-oxygen played in this result is difficult to say. It was the only case in the series which showed untoward remote after-effects.

The condition of the patients during the second stage is, of course, the most important, and the chief criterion of any anæsthetic is, "Does it satisfy the surgeon?" That Mr. R. C. Alexander, the surgeon in charge of the unit, has endured the anæsthetic over a series of 200 cases lasting four months says a great deal in itself, and I think I can safely go further and say that both he and Mr. R. S. Melville have not only put up with, but are enthusiastic about, this form of anæsthesia.

It would be foolish of me to suggest that all the anæsthetics in this series have been perfect. The chief factors leading to trouble have been:—

1. Allowing air to leak under the facepiece. It will easily be understood how much this spoils the balance of an anæsthetic where accuracy in proportion is such an essential.
2. Starting the operation too soon as a result of the smooth quiet induction. In these cases movement occurred at the first incision, but afterwards there was no trouble.
3. Instinctive efforts by the anæsthetist in two directions: (*a*) to avoid cyanosis, letting the patient come round; (*b*) to increase an already deep anæsthesia by giving more gas when what was required was more oxygen—causing spasm and jactitation.

We had difficulty throughout the whole series in preventing air-leaks in sunken toothless faces. Experiments to ensure a satisfactory air-tight inhaler are still being carried out, and several models are under test. The second and third points apply chiefly to the earlier cases of the series and have largely been eliminated by greater experience with the apparatus.

With regard to muscular relaxation, I think all the members of this surgical unit are agreed that gas-oxygen (pure) has met the requirements of every non-abdominal case (where there was no mechanical difficulty in placing the inhaler—e.g., mouth and face operations) and with the easy induction and absence of after-effects have come to regard this agent as the routine anæsthetic of choice. The abdominal group, from the same standpoint, may be divided into operations on the upper and lower abdomen respectively. For all lower abdomen operations in this series gas-oxygen has proved almost without exception to be particularly successful especially for "grid-iron" appendicectomies, for which it has approached the ideal.

This leaves for consideration the most important group of all, both from the surgeon's and the anæsthetist's point of view: the upper abdomen cases (gall-bladders, gastro-enterostomies, partial gastrectomies). The number of these in the series is 32. In one-third of these the anæsthesia was restful and quiet, with perfect relaxation; in another third the patient was distressed by the manipulative efforts of the surgeon, but relaxation at the time of suturing the peritoneum was good. In the last third there were, in more or less marked degree, restlessness, uneven breathing, spasm of the glottis, rigidity of the masseters, and even slight jactitation of the limbs, and the cases were from the anæsthetist's point of view far from satisfactory. Yet in all of them a very interesting thing was noticed—viz., that the peritoneum itself was very lax, that lifting it did not increase spasm of the rectus muscles, and though the viscera showed a marked tendency to bulge into the wound, this was controlled without great difficulty, and the laxity of the peritoneum made suturing less arduous than in many ether anæsthesias which I have seen (and given).

Taking the series as a whole, we had much more success than previous experience of the agent had led us to expect. The number of cases is far too small to base any definite claims on it. The results do indicate, however, that gas-oxygen (pure) given with a suitable apparatus can be substituted for ether and chloroform (and mixtures) as a standard routine agent for a very wide range of cases and with distinct advantage to all concerned.

Cyanosis.

The great controversial point in connexion with anæsthesia by pure gas-oxygen is, of course, the question of "cyanosis." In this series it was found impossible, except in very blonde and anæmic patients, to produce full surgical anæsthesia without cyanosis at some stage of the operation. Generally, at the first incision dark-coloured blood welled into the wound. This is apt to disturb surgeons who are not used to gas-oxygen administration. It is usually taken for granted that this dark blood leads to greater bleeding in the operation area, and one must admit that this is often true, but from the view of various operation wounds which I get from my position at the head of the table, I am quite sure that this is not always the case; in fact, I think that most bleeding comes from the red congested wound frequently met with in open ether anæsthesia. If the surgeon finds in any instance that bleeding is free and disturbing to his work, the anæsthetist must, of course, adapt himself to the requirements, diminish the saturation of gas, and make up the balance with ether. In this series congestion at the wound was never found to be so much a source of trouble as to call for correction, but changes in colour of the mucosa naturally contra-indicate this agent for cystoscopic and proctoscopic examinations; consequently it was never used for this type of case.

Of course, every effort must be made to keep the cyanosis within reasonable limits and to reduce it at the earliest possible moment. It was found possible in this series to let patients return to a pink colour during the quieter parts of the operation, but always before the first incision, on entering or closing the abdomen, and whilst viscera were in any way being pulled upon, it was necessary to give a saturation which caused duskiness of varying degree, amounting in some cases to a definite cyanosis. There at once arises the question of the safety of this degree of saturation. In this series we have had no mishaps [2] nor has any case (with the doubtful exception quoted) caused anxiety on the table or after, though on one or two occasions signs of commencing distress called for use of the safety valve, which in every case produced relief and restored the patient to a bright pink within 30 seconds. Without an arrangement for instantly giving oxygen under sufficient pressure to inflate the lungs I would not deliberately let a patient become blue or remain so for a moment longer than I could help.

A factor making for safety with gas-oxygen is the rather fortunate fact that one cannot over-saturate with nitrous oxide and get good anæsthesia, for as soon as one reaches a certain limit of anoxæmia, before signs of real distress appear, the patient begins to get rigid, and relaxation can only be obtained by giving more oxygen; moreover the observation that, as a case progresses, less and less gas has to be given was amply borne out in this series.

Anæsthetists, whilst agreeing that gas-oxygen is the safest known agent, are practically unanimous in laying down very clearly that this is only so in the absence of cyanosis. It is a matter of common experience, however, that if a patient is to be kept pink throughout with pure gas-oxygen, he will in over 90 per cent. of cases fall short of the state required for even the simplest operation, and the balance necessary for relaxation must be made up with ether. As a matter of fact this is usually what happens and one has frequently felt that in many so-called gas-oxygen anæsthetics the gases have simply formed convenient media for carrying an amount of ether that completely spoils the effect of gas-oxygen. A small quantity of ether given in a closed apparatus corresponds to a very much larger amount poured on to an open mask, and this is especially the case if rebreathing has been employed. "Barely an ounce

[2] Since reading this paper the number of the series has more than doubled. There has been one death "on the table" during induction in a case shown to have been suffering from cerebral syphilis. There was also a death in another theatre during the later stages of an operation for perforated gastric ulcer. Both anæsthetics were given by house surgeons. In my own hands there has so far been no unusual difficulty with this anæsthetic.

of ether" in these circumstances represents a very considerable effect.

Is a moderate degree of anoxæmia, producing cyanosis in blood free from other deleterious agents, necessarily a bad thing in anæsthesia? It must be admitted that we do not yet know exactly how anæsthesia is produced by any given agent. Much experimental work in this connexion has been carried out, but it is difficult for those of us who have no actual experience in this respect and are concerned solely with the clinical side of anæsthesia accurately to appraise the various findings. Air, owing to the high percentage of inert gases, cannot be made the source of oxygen supply, and pure oxygen from cylinders must be used. In this series we found that the saturation of nitrous oxide necessary for ordinary light anæsthesia just about coincided with the commencement of "visible" anoxæmia, whilst for full surgical anæsthesia the proportion of gas had to be increased slightly, producing a definite anoxæmia. From the very great difficulty (amounting almost to impossibility) of maintaining both a pink colour and complete relaxation in healthy adults there would appear to be with nitrous oxide a very close relationship between anoxæmia and anæsthesia, and if this is the case the colour change need not be feared and, properly appraised, is likely to form a useful, though not necessarily in itself an accurate guide to the depth of anæsthesia. It would appear that for every case there is an exact stage in the production of anoxæmia brought about by increasing the nitrous oxide-oxygen ratio at which the patient falls in a perfectly relaxed state. No exact proportion of the gases can be laid down, since the amount of anoxæmia necessary to obtain this result varies with individual idiosyncrasy and with the presence or absence of air leaks in the apparatus, but in this series it ranged between 95/5 to 80/20. In a minority it was possible to reduce the proportion of gas still further. Bad effects from the anoxæmia were particularly looked for, but they were conspicuous by their absence. A number of the cases in this series remained definitely cyanosed during the whole operation without showing the least sign of distress (breathing being quiet and regular, the pulse full, steady, and not unduly quickened), and made an instant trouble-free recovery as soon as the inhaler was removed.

In some cases the path of smooth anæsthesia proved to be a very narrow one, closely limited on either side, and to find and maintain this exact stage proved very difficult. In others, even high abdominal cases, gall-bladders, &c., the administration was entirely trouble-free; so much so that it was found possible to tie the inhaler on the face and leave the patient alone for long periods at a time, the resulting anæsthesia being perfect from every point of view.

An interesting paper showing electrocardiographic tracings of the human heart during and after nitrous oxide anæsthesia appeared in THE LANCET last year.[3] It would be of great value if similar tracings could be taken during a number of actual anæsthetics with chloroform, ether, and gas-oxygen respectively. Efficient portable electrocardiographic machines are now on the market.[4] The tracings show chiefly the effect of a rapid and profound anoxæmia produced with nitrous oxide alone on the heart and demonstrate quite definitely an embarrassment of the myocardium which is absent when small quantities of oxygen are added. The results summarised indicate the possible danger to the patient of excessive anoxæmia, but details of practical value to the anæsthetist, as to the proportion of oxygen necessary to eliminate this embarrassment, are unfortunately lacking. The findings coincide with clinical experience, and I would most unhesitatingly say that to anæsthetise any particular case by producing a rapid and profound anoxæmia with nitrous oxide is undoubtedly dangerous just as to induce anæsthesia rapidly and profoundly with chloroform or ether is dangerous. There must be an element of risk in every anæsthetic that gives full surgical anæsthesia, no matter what agent is used in its production. Whatever its exact action, an anæsthetic is fundamentally a poison which, if given in accurate doses, produces unconsciousness and relaxation, but in only slightly larger doses causes death. The anæsthetist's duty in an extensive surgical operation is to administer and control the poison selected in such a way as to keep the patient poised between life and death, in some cases so near death that all the reflexes are abolished except the vital ones which keep the heart and respiration going. Any poison which so saturates the patient as to cause this state of semi-death must in the nature of things very seriously derange the various physiological functions of the body and constitute a grave risk to life. All anæsthetics are poisons and necessarily bad for the patient, but if they vary at all in the manner of induction, toxicity, rate of elimination or after-effects, it is our duty to select the safest and the least unpleasant. Certainly any degree of anoxæmia producing cyanosis is in itself a bad thing, but clinically in my opinion there is every reason to believe that a patient saturated with nitrous oxide to the extent of producing cyanosis of moderate degree, in the absence of other signs of embarrassment, is less dangerously poisoned than one in whom ether or chloroform has been used to produce the same degree of relaxation. I must repeat and emphasise the necessity for having an apparatus capable of accurate adjustment and of instantly and effectively correcting any excess of cyanosis.

The Present Position.

Dissatisfaction with open ether as a routine anæsthetic has resulted in various other forms of anæsthesia being put into more extensive use—e.g., local infiltration, spinal and rectal. They must all be considered on their merits in connexion with individual cases. The object of publishing this summary is not to displace any of the newer methods in favour of gas-oxygen for any particular case, but merely to suggest this agent as one very effective substitute for the inhalation of ether or chloroform as a routine.

The contra-indications to gas-oxygen are comparatively few; face and mouth operations present mechanical difficulties to the exclusion of air; changes in colour render this agent unsuitable for endoscopic examination of mucosæ, and congestive bleeding is likely to make certain operations difficult—e.g., colporrhaphies and operations requiring detailed dissection, especially where there may be mechanical obstruction to the air-way, as in operations for glands of the neck. It is more difficult to use but not necessarily contra-indicated in robust, toxic, alcoholic adults; indeed, difficulty with gas-oxygen most commonly occurs in cases where difficulty would also be found in using ether or chloroform. It is said to be unsuitable for cases with heart disease, but trouble in this respect was not encountered in this series. Children required continuous fresh gases and were easily embarrassed by rebreathing. In this series we had only two infants under one year, and for these I preferred to use alcohol, chloroform, and ether mixture with oxygen.

So far as one can make out there is a definite trend towards more general use of gas-oxygen. The reason why chloroform and ether have held their own for so long is that they require only the simplest of apparatus for administration, and this is a point which must necessarily weigh strongly with the profession generally when comparing the merits of various anæsthetic agents. The advantages of gas-oxygen are certainly gained at the expense of portability. The McKesson Model G used in this series is an expensive apparatus, and the same may be said of others at present in the market. These factors should not be allowed to weigh too strongly in the case of institutions where every patient who enters a surgical ward receives at least one anæsthetic. A sum of £100 spent on anæsthetic apparatus seems to me to be of infinitely greater proportionate value than £2000 to £3000 spent

[3] Ward, G. E. S., and Wright, S.: THE LANCET, 1929, ii., 1184.
[4] Goodall, J. S., and Hoskin, T. J.: Brit. Med. Jour., 1930, i., 107.

on radium with its comparatively limited application. There is without doubt, however, a call in this country for an efficient, cheap, portable outfit and for better and cheaper gas. It is likely that a more general demand for gas-oxygen would stimulate production. The actual cost of the nitrous oxide and oxygen used in this series worked out at slightly less than 2*s.* 6*d.* per case; this includes transport of the cylinders, a considerable item which would be largely eliminated with more general use and the laying down of more depôts.

Gas-oxygen has, of course, a much wider application than has been considered in this summary, which deals only with its advantages in a general surgical unit.

One of the most satisfying features in carrying out this series has been the number of successful anæsthetics given by Dr. Jeffrey, house surgeon to the unit, who, though he has an undoubted flair for this kind of work, had no previous experience of anæsthesia except that gained as a student. His successful use of gas-oxygen in acute abdominal cases has been particularly valuable.

In conclusion, I must thank Mr. Alexander and Mr. Melville, not only for their ready acquiescence in the carrying out of the series, but for their whole-hearted encouragement throughout.

Clinical and Laboratory Notes.

FURTHER REMARKS ON ENTERIC AND THE WIDAL TEST.

By Eustace Thorp, O.B.E., M.B. Belf., L.R.C.P. Edin., D.P.H.,

DEPUTY MEDICAL OFFICER OF HEALTH FOR SUNDERLAND.

Recent communications from bacteriologists on the value of the Widal test from their point of view lead me to elaborate my previous remarks[1] on this test from the clinical aspect, in view of further cases seen since that time. In the former note I drew attention to the long delay in the appearance of the reaction in many cases of enteric fever, including abortive and ambulant cases. Indeed, the test often only became positive long after a clinical diagnosis was possible and sometimes only late in convalescence after repeated negative results. So doubtful did I become of the test after seeing undoubted cases of clinical enteric die before a positive result was obtained, that I held up other negative cases and took repeated blood tests and in many instances finally obtained positives from the twenty-sixth day onwards. Frequently a test with negative result had been taken by the practitioner outside hospital, and this negative had postponed or altogether prevented the patient's admission. The history of a negative Widal would no doubt also modify the after-treatment, enteric being ruled out both in the patient and in other members of the family who might become ill.

I have formed the opinion that the margin of error in the reaction is much greater than is generally supposed, that a negative reaction is not of importance where clinical evidence is present, and that a late Widal or repeated Widals must be taken before excluding the disease. I now add a few selected examples from cases where the patient lived long enough to obtain a positive result—as some unfortunately did not. They show how possible it is for such cases to be missed or written off as "pyrexia of unknown origin," and the existence of such cases shows where the odd sporadic case comes from.

Case 1, aged 39. Her father died on Jan. 1st, 1930, of "broncho-pneumonia"; the patient nursed him and took to bed on Jan. 14th. The Widal test was negative on Feb. 3rd and positive, 1–125, on Feb. 20th. Clinically enteric was diagnosable on Jan. 22nd.

Case 2, aged 57, was ill for five weeks with irregular pyrexia. He had a typhoid tongue and a somewhat enlarged spleen. On account of a stool containing blood, a Widal was taken by the practitioner on March 3rd, 1930, the eighteenth day of the illness, and was negative then and again on March 13th. It was positive on March 23rd and 31st. This was admittedly an atypical case but it is just such cases which require detection.

Case 3, aged 20, was admitted on the fourth day of the illness, having had vague abdominal pains, and was notified as enteric on account of a typhoid tongue, a slightly enlarged spleen, and a high remittent pyrexia. In hospital the patient appeared well except for pyrexia. Blood culture was negative on March 3rd, 1930. The fæces and urine were negative on March 7th. Widals were negative on Feb. 20th and 24th. The chest was X rayed and showed no abnormal findings; sputum was negative. The Widal was positive on March 18th, 1–500.

Case 4, aged 28, was admitted on the fifth day of the disease; the temperature fell on the eighth day. The Widal was negative on the ninth day, but ten days later was positive, the temperature having remained down.

The following points impressed me most in these atypical and ambulatory types: (1) The typhoid tongue was usually recognisable. (2) No typical temperature chart was common to all, nor did the continued type of pyrexia appear; apyrexia was common. (3) The appearance of rose spots was delayed, if they appeared at all, and Widals were negative until well into convalescence. (4) Any hæmorrhage from the bowel, however slight, in supposed pneumonia is of great importance, especially in apparent convalescence; a positive Widal is frequently obtained after this. (5) When pneumonia is prevalent, cases such as the above may masquerade as pneumonia. (6) To obtain a positive Widal the stay in hospital may have to be prolonged. (7) Death may occur from hæmorrhage or toxæmia before a "positive" can be obtained. (8) The Widal usually came down, even in ill patients, in dilutions up to 1–500.

[1] The Lancet, 1928, ii., 972.

SOME ASPECTS OF IODINE THERAPY.

By W. Mitchell Stevens, M.D., F.R.C.P. Lond.,

SENIOR PHYSICIAN TO THE CARDIFF ROYAL INFIRMARY; FELLOW OF UNIVERSITY COLLEGE, LONDON.

In his "Principles and Practice of Medicine" Osler writes: "Longevity is a vascular question, which has been well expressed in the axiom, 'A man is as old as his arteries.' In a majority of men death comes primarily or secondarily through this portal." The truth of the above remarks is indisputable, but, nevertheless, one naturally feels inclined to ask the question, Can these vascular affections (and associated heart affections) be prevented, be delayed or, having once set in, be arrested for a shorter or longer period?

For many years I have been studying the uses of iodine (as iodides) in arterial affections such as aneurysm, arterio-sclerosis, high arterial blood pressure, and other related conditions, whether such be of syphilitic or other origin, or merely the accompaniment of what is termed "senility." I am confident that the exhibition of iodides may prevent or retard arterial changes and arrest them, when present, for shorter or longer periods, and that the doses required for various purposes vary from very small, even minute, quantities to large amounts, and that no ill-effects whatever occur from the drug itself when judiciously given.

I regard the arterial changes occurring in what is called "old age" to be similar in kind to the changes due to other causes. It appears that senility is, in one sense, a disease and, doubtless, an inevitable one if a person survives long enough, so to speak, but I am inclined to think that, as far as the arteries are concerned, it is a deficiency manifestation or, in other

words, that some substance normally present in the blood which defends the arteries becomes deficient either in quantity or quality or both, and that this deficiency may be the expression of a defect in what may be broadly called iodine metabolism, and that it may be corrected, at least for a time, by giving iodine, even in minute doses, bearing in mind the remarkable selective absorption shown for this element where needed.

Iodine is present in all plants and animals, and maybe this extraordinary element will come to be recognised as the harmoniser of the hormones. I visualise the day when the duration of life of a considerable proportion of the human race may be extended, and when distressing heart affections not due to what may be called external agencies may be far less prevalent than they are at the present time.

Medical Societies.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

A MEETING of this Society was held at Leeds on April 11th, with Dr. J. W. BURNS, the President, in the chair.

Clinical Cases.

Dr. A. M. CLAYE (Leeds) described a case of congenital rectovulval fistula with multiple fibroids impacted in the pelvis and obstructing the progress of a full-time labour. Her menstrual history had been normal throughout life, and she had no discomfort during gestation. Dr. Claye delivered her of a living male child by Cæsarean section, and followed this by performing subtotal hysterectomy. Both patient and baby recovered well. He had been able to find in the literature only two cases in which a patient became pregnant with this abnormality.

The PRESIDENT recalled that in 1929 he had reported a similar case to the society where the patient, who had three children, was unaware of her abnormality.—Mr. W. GOUGH (Leeds) said he had seen a similar case.

Mr. A. GOUGH (Leeds) described two cases of excessive uterine hæmorrhage associated with enlarged ovaries in young women. In one case the patient, aged 22, had suffered from menorrhagia and metrorrhagia for two years, which continued in spite of curettage. An operation was performed in which the right ovary was removed and half the left ovary resected. The excessive loss was improved. In the other case the patient, aged 23, gave an identical history, though the losses had only been excessive for seven months. In each case the removed ovary was between three and four times the normal weight, of a "succulent consistence," showing histologically increased stroma and numerous small cysts. He said there were few references to this condition, which he considered rare, but that similar observations had been made by Blair Bell, Whitehouse, Wilfred Shaw, Cotte, and Fekete.

Mr. ERIC STACEY (Sheffield) said he thought this condition of hypertrophy and formation of cysts of the ovary, associated with excessive losses, in young women was very common indeed, and he had operated on many cases in which by partial resection he had reduced the bulk of the ovaries, with cure of the patient. In his opinion the condition was associated with most of the causes of pelvic congestion, whether physical or psychological.—Mr. A. A. GEMMELL (Liverpool) thought this was true of some cases, but many young women suffered from menorrhagia in which the cause was excessive function of the thyroid and would be cured by applications of X rays to that organ, whilst others had similar symptoms due to hypothyroidism, and were improved by taking thyroid daily for some months.—Dr. J. W. A. HUNTER (Manchester) considered that administration of calcium chloride intravenously with the addition of parathyroid would usually prevent operation in these cases.

Spinal Anæsthesia.

Dr. HUNTER read a short note on the Value of Spinal Anæsthesia in Cases of Difficult Midwifery. He thought its scope was limited, but there was an advantage in the greater relaxation of the birth passage without interference with the uterine contractions; also chest complications seemed to be less and there was easier breathing than under general anæsthesia. The greatest advantage of spinal anæsthesia was that it improved the prognosis in cases where an otherwise healthy patient had developed a temporary acute anæsthetic bronchitis as a result of one or several previous and badly administered anæsthetics. He advocated its use, therefore, in cases of failed forceps. He had also used it in three cases in which a dry, prolonged labour, with a rigid, undilated cervix was ended by cervical hysterotomy and forceps delivery. He had also used it in heart disease.

Dr. BURNS read the communication published in THE LANCET of May 10th, p. 1012. He considered that the scope of spinal anæsthesia in midwifery was limited to Cæsarean section, and by its use in this operation had found there was a diminution in the amount of blood lost with no increased risk to mother and child, and a more speedy recovery of the patient, without chest complications.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF MEDICINE.

A MEETING of this Section was held on May 23rd, with Dr. R. J. ROWLETTE, the President, in the chair.

Meningitis and Encephalitis.

Dr. R. H. MICKS read a communication entitled Atypical Meningitis. Last year, he said, he had seen three cases of meningitis which had presented the following symptoms: (1) a cerebro-spinal fluid which was turbid with polymorphs; (2) absence of organisms as tested both by direct film examination and culture on standard laboratory media; (3) negative Boveri reaction; and (4) an atypical course in that two out of the three recovered, and the third showed a very striking and well-maintained improvement until the patient died suddenly with a normal temperature. Mild recoverable meningitis was undoubtedly more common now than was once believed. Encephalomyelitis and associated meningitis of various types had increased in frequency—especially the type associated with vaccinia and measles—and there had been sporadic cases which were not associated with exanthems and were not apparently similar in course or post-mortem appearance to encephalitis lethargica. Six cases of this kind had been described by Russell Brain and others.[1] But in all these examples of mild meningitis the cell count was usually low, and the predominating cell the lymphocyte. A marked polymorph increase was apparently very rare in a meningitis which was not due to recognisable bacteria. For this reason he had thought these three cases worth recording as something well-removed from a lymphocytic meningitis or a "meningismus." In Dr. Micks's opinion Boveri's reaction, if properly carried out, was of great diagnostic value in clear or nearly clear cerebro-spinal fluid. He had noticed that a very marked polymorph leucocytsis might follow intrathecal injection of a foreign protein. This rather alarming phenomenon was not sufficiently known;

[1] THE LANCET, 1929, i., 221.

indeed he had only been able to find one reference to it in the literature.

Dr. V. O. McCORMICK described the illness of one of the patients. There were no localising symptoms from the first day of the illness.

Dr. V. M. SYNGE read a paper on Mumps Meningitis.

His patient, a boy aged 9, first complained of severe headache and vomiting on May 4th. He was seen by Dr. J. F. O'Grady late the following evening and was sent into the Royal City of Dublin Hospital. His temperature was 104° F., and the pulse-rate 136; he was delirious, semiconscious, and incontinent of urine; the neck was stiff, and there was a slight doubtful Kernig sign. The pupils were equal and reacted to light; the knee-jerks brisk, especially the left, and the right parotid swollen. Lumbar puncture (on May 6th) gave a clear fluid under slightly increased tension; globulin was increased, sugar absent, and the Boveri test negative; the fluid was sterile on culture and showed no tubercle bacilli; it contained 300 cells (lymphocytes) per c.mm. The patient gradually improved and left hospital on May 21st perfectly well.

The enlarged parotid, the character of the cerebro-spinal fluid, and the rapid recovery left no doubt, said Dr. Synge, of the diagnosis of mumps meningitis. Roux stated that meningitis occurs in 1 per cent. of cases of mumps, while Dopter gave 9·8 as the percentage of cases which showed meningeal symptoms, though he did not regard all of them as true meningitis. In Dublin meningeal complications certainly did not reach these figures.

The PRESIDENT spoke of a case of urticaria which he had treated some years ago and which showed symptoms of meningitis. He gave salicylate of soda, and the patient got perfectly well. No lumbar puncture had been done, and there had been no such thorough examination as would now be made.

Dr. J. O'CONNOR mentioned a case which he was looking after in hospital, a baby of 10 months old.

Vaccinated on May 3rd he became ill on the 10th, being cross and very restless, with vomiting. Next day he was quiet and apathetic, and on admission to hospital his condition resembled tetanus. Lumbar puncture was done and fluid was removed under tension, but proved to be perfectly clear. The Boveri reaction was positive. After lumbar puncture the tetanic spasms completely disappeared, but next night further spasms occurred, and there was some rigidity of the neck. When Dr. O'Connor tried to obtain Kernig's sign, the whole musculature of the child's body was thrown into action. A further lumbar puncture was done, and again Boveri's reaction was positive. Lumbar puncture had been done three times subsequently, and that day a ventricular puncture had been done through the fontanelle, clear fluid being removed under tension.

At first, said Dr. O'Connor, it was thought that the case might be one of encephalitis following vaccination, but the vaccination had not taken, and there had been no reaction at all. The child was afebrile, and no focus of infection could be found.

Dr. CYRIL MURPHY mentioned the possibility of the infection coming from the antrum and producing inflammation of the dura and a slight Boveri reaction. He referred to a case of this kind in which the patient ultimately made a good recovery. He thought that too much reliance should not be placed on the Boveri reaction.

Dr. A. HALPENNY said she had found that cases in which the cerebro-spinal fluid was clear and contained lymphocytes and polymorphnuclear cells and in which an immediate positive Boveri reaction was obtained were invariably tuberculous.

Dr. G. E. NESBITT referred to cases which might or might not be classed as meningismus, in which the fluid was opalescent.

One evening a lady got a severe headache and vomiting, and next day she stayed in bed. On the following day she was no better and was seen by Dr. Nesbitt. She was very dazed, and had indefinite symptoms. He did a lumbar puncture and removed turbid fluid. Antimeningococcal serum was then injected. No organism was found in the fluid. Lumbar puncture was done again the following day, and more serum was injected. After three days a few meningococci were found with great difficulty. The patient made a complete recovery.

Dr. Nesbitt thought it possible to have meningococcal infections in which the organisms were so few that it was impossible to find them. He mentioned a case of encephalitis with undoubted signs of meningeal infection which he had recently seen.

Dr. J. LAIT mentioned a case of tetanus which had been admitted to hospital with definite trismus.

A lumbar puncture was done and the fluid was quite clear, but there was a slight increase in the cell content. Serum was injected, and on the following day another lumbar puncture was done, and 10 c.cm. of turbid fluid was removed. More serum was injected, and the fluid on examination proved to be full of pus cells. The patient's symptoms did not increase, in fact, his condition rather improved. In a couple of days the fluid was sterile.

This case, Dr. Lait thought, brought out the fact that an increase in polynuclear cells following the injection of serum took place. The patient made a complete recovery.

Dr. A. R. PARSONS suggested that it was rather rash to inject antitoxin "on the offchance." He personally always had the fluid examined first to see if meningococci were present.

Dr. MICKS, in replying, said his cases had all been ones in which there were clearly marked symptoms of meningitis, and in which the fluid had come out quite turbid. He did not regard any of his cases as meningococcal meningitis. He thought that whenever turbid cerebro-spinal fluid was found it was necessary to inject meningococcal antiserum before receiving the report on the fluid, for it was sometimes very hard to find meningococci. If the infection was not meningococcal no harm was done, provided care was taken to avoid protein shock in a sensitive patient.

Spirochætal Jaundice.

Dr. NESBITT described the case of a man aged 22 who was sent to hospital in November last as a case of "acute abdomen."

About 10 A.M. three days previously, when working in the fields, he got violent pain between his shoulder-blades. This pain travelled down, and in the afternoon became so severe that he had to stop working. A couple of days later he came to hospital. He looked very toxic, and there was a definite icteric touch in the skin. His tongue was very furred, temperature normal, pulse 100. He vomited almost without ceasing from the time of his admission. The urine contained albumin and there was a slight reduction of Benedict solution. The case was at first thought to be one of either acute pancreatitis, typhoid fever, spirochætosis, icterohæmorrhagica or trichinosis.

On the second day after admission his condition was much the same, the vomiting persisted, and he complained of severe thirst, and very severe pain in his legs. Morphia gr. ⅓ was given without relief, but after the dose had been repeated an hour later the patient slept. A blood film showed eosinophilia; a blood culture was negative. That evening he was a little better, and his pains had quite gone, apparently owing to the morphia. Next day, though jaundice was very marked, he said he felt better, and had no pain; but he was still vomiting, very thirsty, and passing no urine, and he developed a crop of red spots on his shoulders. Next day he had a bad hiccup, was still vomiting, and was very heavy and drowsy. Fisher's solution was injected. On the day afterwards he was still passing no urine, and complained of great abdominal pain, much like the pains in his legs. It was then thought that he must be suffering from some acute abdominal condition. On the following morning he passed about 2 c.cm. of urine, greenish in colour, but containing no spirochætes. The abdomen was rather distended and tympanitic, but soft. Pituitrin was given, and immediately relieved the abdominal pain. At 1 o'clock he became very weak and said he could not breathe, and at 1.45 P.M. he had a similar attack and died.

Post-mortem examination showed nothing very remarkable. The liver and kidneys were large and smooth. The mucous membrane looked as if some strong acid had been put over it which was dissolving it away. All the organs were intensely bile-stained, but histologically showed very little damage considering the toxic condition of the patient clinically.

Spirochætal jaundice, said Dr. Nesbitt, had been described by Weil in 1886, but it appeared that the same disease had previously been described by

many authors. In 1914 spirochætes were found in the liver of a guinea-pig which had been inoculated with the serum of an infected patient.

Dr. T. T. O'FARRELL said he had examined specimens from the lungs, liver, pancreas, spleen, intestine, and a gland from the stomach in this case. He found nothing in the pancreas, but in the spleen he found an organism, but failed to find organisms anywhere else, except in the kidney where he found a few. He was quite convinced that they were spirochætes, but it was impossible to say whether they were leptospira or whether the spirochætes were the causal organisms.—Dr. LAIT said he had examined specimens from this case and had not found any spirochætes. He thought it possible, however, that they might have been present, but was confident that there were no leptospira.—Dr. W. H. ASHMORE mentioned the possibility of the case being one of metallic poisoning, and asked if the organs had been examined for arsenic.

Dr. O'CONNOR referred to a case reported by V. de Lavergne [2] of a man who fell into a ditch, and a few days later developed well-marked jaundice and epistaxis and complete anuria. In this case it was proved that the man had not swallowed any virus, and infection must have been via a scalp wound 16 days old.

Dr. NESBITT, in replying, said he had thought of arsenical poisoning, but no evidence of arsenic had been found in the organs examined. He thought the organs would have shown more damage histologically if it had been a case of arsenic poisoning. Patients with spirochætal jaundice were usually said to suffer from diarrhœa, but his patient had obstinate constipation.

Dr. LEONARD ABRAHAMSON showed a patient suffering from myelogenous leukæmia.

Rebiews and Notices of Books.

RHEUMATISM.

Arthritis and Rheumatoid Conditions. By RALPH PEMBERTON, M.S., M.D., Physician to the Presbyterian Hospital, Philadelphia; Associate Professor of Medicine in the Graduate Medical School of the University of Pennsylvania; Chairman of the American Committee for the Control of Rheumatism. London: Baillière, Tindall and Cox. 1929. Pp. 354. 25*s*.

THIS book will prove of great value to all wishing to become familiar with recent work on rheumatoid conditions and arthritis. The treatment of these diseases has too long been a fruitful field for the unqualified practitioner, and the whole subject needs to be thoroughly investigated and placed on a more scientific basis; this Dr. Pemberton and his associates have attempted to do, and in as far as our present state of knowledge allows they have been successful. Especially interesting is the section named rather oddly "dynamic pathology," which is the study of the nature of the disturbances in the normal physiology in early stages of arthritis. The importance of this line of investigation is self-evident and the work on sugar metabolism, capillary circulation, and the constitution of the synovial fluid is of great significance from the point of view of ætiology and treatment. Physiotherapy will no longer merit the reproach of being an empirical form of treatment if these careful researches reveal that the general beneficial results can be explained by its effects on the biochemistry of the blood and on the circulation. The work already done demands the abandonment of several popular theories, such as the supposed rôle of lactic and uric acid in these diseases. The proper treatment of arthritis is, as the author says, one of the most involved chapters in modern medicine, and this book should help to clear the way.

[2] Bull. et mém. Soc. méd. des hôp. de Paris, 1928, lii., 1498.

Der Sogenannte Rheumatismus. By Dr. JULIUS BAUER, Professor an der Universität Wien. Dresden and Leipzig: Verlag von Theodor Steinkopff. 1929. Pp. 136. M.10.50.

THE purpose of this little book is to summarise for the benefit of the general physician the most significant work that has been done of recent years on the so-called rheumatic conditions. The localisation, pathology, anatomy, and ætiology of the different manifestations are first discussed, then each type is described separately, together with appropriate therapeutic measures; particularly those the author has from personal experience found of value. In discussing the ætiology of primary chronic arthritis Dr. Bauer says that the streptococcus which can occasionally be isolated from the joint and can in 90 per cent. of cases be found in the gut will, on intravenous injection into a rabbit, produce a non-suppurative arthritis; on the other hand, the strain found in the tonsils and the teeth will not produce typical joint changes. He makes the observation that a positive blood culture in these cases can only be obtained in autumn and winter, never in summer or spring. In our experience a positive blood culture in chronic arthritis is very rare. In the treatment of acute rheumatism Dr. Bauer considers sodium salicylate as good or better than any of the modern preparations, and in order to avoid upsetting the stomach with the large doses he finds necessary, part is given twice daily per rectum and the rest by the mouth. Iodine he finds of value in both specific and non-specific joint affections; it is given intravenously and may be injected directly into the joint. This book can be strongly recommended. It is relatively short and is easy to read.

MODERN TREATMENT OF DISEASES OF THE THROAT NOSE, AND EAR.

By H. LAWSON WHALE, M.D.Cantab., F.R.C.S.Eng., Surgeon to the Special Department at the Hampstead General Hospital. London: Jonathan Cape. 1930. Pp. 128. 5*s*.

THIS little book is one of a series on Modern Treatment, so planned that the general practitioner should be able to acquire for a small price, and to keep at his elbow or in his pocket reliable guides to the present state of opinion and practice in some of the special branches of medicine and surgery. Mr. Lawson Whale has made a brave attempt to cover an enormous field within the limits of 128 small pages, and the bibliography at the end of each chapter will be of use to those wishing to go more thoroughly into any particular detail. Written on a strongly personal note, the book makes interesting and amusing reading.

CANCER OF THE LARYNX.

Treatment of Intrinsic Cancer of the Larynx and Hautant's Method of Hemilaryngectomy. By MARCEL OMBRÉDANNE, Assistant in the Oto-laryngological Department of the Tenon Hospital. Paris: Masson et Cie. 1930. Pp. 135. Fr.25.

Dr. Hautant's experience of intrinsic cancer of the larynx has not been entirely, or even principally surgical, for most of the 200 cases which have come under his observation during the last ten years have been treated by radiotherapy at the Curie Institute. He has, however, in the last four years treated 65 cases by operation, and has elaborated a technique which Dr. Ombrédanne, his assistant and former resident, describes in the present work. The author, therefore, takes a wider standpoint than that of purely surgical intervention, and we have not seen a better résumé of the present position of the treatment of endolaryngeal cancer than that contained

in the preliminary chapters of this book. The result of treatment by X rays and by radium is discussed, as well as those of the operations of laryngotomy and laryngectomy. The experiences are detailed of the more prominent exponents of these methods throughout the world, and a very complete bibliography is appended. Though the author is not dogmatic, his point of view may be summed up as follows. Radiotherapy is giving very good results, but it is at present impossible to foresee the effect of this treatment in individual cases and therefore surgery still remains our principal weapon, especially in cases of epithelioma of the cutaneous or intermediate types. Laryngectomy is achieving better results than formerly, largely because the indications for operation are more strictly formulated, and cases are no longer considered operable when the arytenoid is even slightly swollen or the anterior wall of the pyriform sinus a little bulged. On the other hand, laryngotomy has extended its sphere, largely under the influence of StClair Thomson in England, to include cases involving the anterior commissure and the subglottic region, and has indeed become a kind of internal hemilaryngectomy.

Under these circumstances Dr. Hautant believes that there is scope for an intermediate operation of the type of hemilaryngectomy which Dr. Ombrédanne here describes minutely with the assistance of a series of excellent drawings. The chief features of this operation are that the section through the thyroid cartilage is made a little to the sound side of the anterior commissure; the anterior part of the cricoid on the diseased side is resected and the posterior two-thirds of the thyroid ala are spared, the anterior third being removed in one piece with the growth. Posteriorly, the section is made through the body of the arytenoid cartilage; the posterior wall of the larynx, forming the interarytenoid curtain, is not removed; the lumen of the larynx is not opened until the last stage of the operation; the cavity is packed until the fourth day, and the patient is able, and encouraged, to drink immediately after the operation. The tracheotomy tube is removed at the end of three weeks, but a permanent cannula has been necessary in the only two women submitted to operation. The author is of opinion that cases with invasion of the anterior commissure or subglottic region, too extensive for the operation of laryngotomy, can be treated by this method with far better functional results than can be obtained by laryngectomy. Well and clearly written, this little book should be read by all interested in the treatment of cancer of the larynx.

SOME ASPECTS OF THE CANCER PROBLEM.

Edited by W. BLAIR BELL, B.S., M.D.Lond., F.R.C.S.Eng., Director of the Liverpool Medical Research Association. London: Baillière, Tindall and Cox. 1930. Pp. 543. 64*s*.

Prof. Blair Bell has undertaken a considerable task in editing this comprehensive collection of papers on the cancer problem. Most of them have appeared in the medical press at various times, and many of them were originally published in THE LANCET. The book links up the various steps in the development of lead therapy from its inception in 1920 to its present interesting but still indecisive position. The earlier papers are chiefly concerned with the theory of the similarity between malignant cells and chorionic epithelium, which gave rise to the use of lead as a therapeutic agent, and with the nature of cancer, viewed as a specific process, rather than as the consequence of a specific cause. Reports on a number of elaborate biochemical investigations of the normal and the malignant cell membrane follow, with reference to their permeability, and a series of papers on the hydrogen-ion concentration of the blood and tissues in normal persons, cancer patients, and fœtal rabbits. Some inferences are drawn from experiments showing similar metabolic behaviour in chorionic epithelium and malignant tissue, and the effects of metallic salts on the metabolism of various tissues are discussed, with especial reference to the action of lead. Several papers follow on the effects of lead on growth in plants and animals, and some detailed work on its action on the chorion and on cancer cells; various preparations of lead, their fate in the body, and their toxicity are discussed. The final chapters include papers on the treatment of cancer with lead, and the present position of lead therapy, followed by a detailed series of cases in which the treatment has been used. In some of these the results appear to have been inconclusive, in some it is still too early to draw definite inferences, but there remain a proportion in which lead therapy appears to have produced a temporary or permanent benefit. The book ends with a brief summary of the position—too brief perhaps to convey a balanced idea of the whole; indeed, the book itself, in spite of the paragraphs connecting the reprints is rather incoördinate. But it provides a valuable aggregate of the literature on lead therapy which has emanated from the Liverpool school.

MICROSCOPIC PHARMACOGNOSY.

By WILLIAM MANSFIELD, A.M., Phar.D., Ph.G., Dean and Professor of Botany and Materia Medica, Union University, Albany College of Pharmacy, Albany, N.Y. London: Chapman and Hall, Ltd. 1929. Pp. 211. 15*s*.

AN essential part of the training of the student of pharmacy is in the technique of examining powdered drugs by the microscope, so that he may become familiar with the cellular structure and cell contents of the different parts of plants in common use. In this text-book, designed for such students, the author has selected typical drugs in order to include practically every type of cell to be found in the official pharmacopœias, and has illustrated every part of the description with numerous drawings drawn to scale. The reader is thus offered a pictorial as well as a written description of each drug. The book should prove of value to students of pharmacy, and will be appreciated as a handy work of reference by pharmacists and drug analysts.

HOW TO STAIN THE NERVOUS SYSTEM.

By J. ANDERSON, Head Laboratory Assistant at the National Hospital for Diseases of the Nervous System, London. Edinburgh: E. and S. Livingstone. 1929. Pp. 139. 5*s*.

THIS excellent manual of staining methods should be of value to the general as well as the special histologist. Among many useful stains, two, tested by the reviewer, may be specially recommended. The one gives directions for ripening carmine solutions, and has been found satisfactory on dye from six different sources; the second is a counter-stain and mordant for nuclei to be used with Mallory's aniline-blue-orange-G. Its constituents are at hand in any laboratory, and the difficulty of nuclear staining is overcome without recourse to azan.

DISEASES TRANSMITTED FROM ANIMALS TO MAN.

By T. G. HULL, Chief Bacteriologist, Illinois Department of Public Health. London: Baillière, Tindall and Cox. 1930. With 29 text figures. Pp. 350. 25*s*.

IN 1796 Jenner wrote "the deviation of man from the state in which he was placed by nature seems to have proven to him a prolific source of diseases. From the love of splendour, from the indulgences of luxury, and from his fondness for amusement, he has familiarised himself with a great number of animals, which may not originally have been intended for his associates." And in this book Dr. Hull gives a straightforward satisfying account of the consequences of man's interference with the order of nature, and details the various human diseases

in the causation and transmission of which the higher animals play an essential or substantial part. Most of the information is not difficult to come by in other books, but it is convenient to have it put together in this form, especially perhaps for veterinarians.

PARENTHOOD: DESIGN OR ACCIDENT?

Second edition. By MICHAEL FIELDING. Introduction by H. G. WELLS. London: Noel Douglas. 1930. Pp. 168. 3s. 6d.

THIS is a revised and enlarged edition of the book that was reviewed in our columns two years ago. "Michael Fielding" is a pseudonym; the author is a medical man who wishes to remain anonymous. This edition has been brought thoroughly up to date, and will prove of much value, not only to the couple wanting information on the control of conception, but also to the medical practitioner desirous of knowing what research is being done on the subject, and what the prospects are of improving the existing methods. A valuable chapter on "Methods of the Future" includes accounts of temporary sterilisation by spermatoxins, hormones, and X rays, and of some of the researches of the Birth Control Investigation Committee. An excellent description of the recently popularised German spermaticides includes a short note on some of the findings of Dr. J. R. Baker with regard to the comparative spermaticidal power of soluble pessaries on the market. The book fully bears out the introductory remark of Mr. H. G. Wells, who says: "It is at once the most exact, plain and unexciting handbook on these intimate mysteries that I have ever read." It is, moreover, impartially written. Upon the relative value of different contraceptive methods, and upon the general satisfactoriness and reliability of these methods—which are more and more being called into question—the author writes objectively and without bias. The book is unique of its kind, and can be warmly recommended to medical readers.

THE SEX FACTOR IN MARRIAGE.

By HELENA WRIGHT, M.B., B.S. Introduction by Rev. HERBERT GRAY, M.A. London: Noel Douglas. 1930. Pp. 100. 3s. 6d.

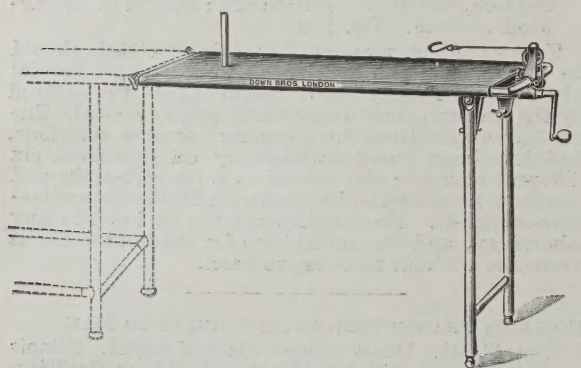
THE reader is informed in the introduction that this book "is addressed to those about to be married in the hope that it may save them from mistakes and sufferings which have darkened married life for thousands of couples." It contains six chapters on the sexual side of marriage, the nature of the sex act, the sex organs of men and women, difficulties in early marriage, the perfect sex act, and finally, a chapter entitled "Other practical issues." The volume is prefaced by a quotation from the Archbishop of Canterbury, in which freedom of discussion on sexual matters is demanded, and it stresses throughout the spiritual side of marriage. From this, it must not be inferred that the physical aspects of the relation are glossed. On the contrary, they are described in detail, and the comprehension of the layman is aided by familiar diagrams of the genital organs.

Though it may be thought by some that too much stress is laid on processes of genital manipulation, the book can safely be recommended by medical men to those about to get married who ask for advice.

New Inventions.

A TRACTION FRAME FOR FRACTURES OF THE LEG.

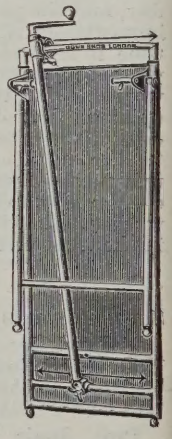
I HAVE had made a portable extension apparatus (shown in the illustrations) which may prove useful in such hospitals as are not equipped with special orthopædic facilities. It presents the following advantages: (1) It is simple and quick to adjust. (2) Although possessing enormous power, any degree of extension can be provided without effort, as



The traction frame attached to an operating table.

gradually and as gently as desired, in order to overcome muscular contraction without unnecessary damage to the soft parts. (3) If open operation is required the actuating mechanism is distant from the site of the wound. The desired result is obtained with less disturbance of the periosteum and the neighbouring tissues than is inevitably produced by powerful manipulation with forceps, or by turning the ends of the bone out of the wound, in the attempt to engage the fragments in shoehorn fashion. It should be readily adaptable to any ordinary type of operating table.

The suggestion is not made that this apparatus should take the place of preliminary extension by ordinary methods, but the frame offers certain facilities for operative work, particularly in the case of malunited fractures with muscular retraction. Under such circumstances it is simple and positive in use. The extension is applied through the medium of a leather anklet, which is attached by a hook to a flexible steel cable. Where it is desired to maintain only a moderate degree of extension to enable the limb to be encased in plaster, the anklet may be made of coarse flannel, this being incorporated in the splint. Counter extension is provided by a perineal post or by perineal bands attached to the head of the table. The apparatus consists of the usual zinc top mounted upon a frame which is attached to the foot of the operating table. In the case of the Quadrant Model table, the traction frame has been made of sufficient length to temporarily replace the normal leg-rest. The mechanical extension is by screw gear controlled by a crank at the far end. The cable passes over two pulleys and it is so guarded that it cannot leave the wheels when in action. The end of the cable is fixed to a slide block working on an endless screw. The complete gear is carried on parallel tubular bearings to afford sufficient lateral adjustment for a direct pull on either leg. Ratchet wheel or other retaining device is not required since no degree of tension will cause the crank to unwind when released from the hand; this retains its position until deliberately reversed. The whole of the gear is so arranged that it is situated under or at the far end of the table. The legs which are adjustable for height are made to fold and the perineal post is detachable.



The traction frame folded.

The frame is made by Messrs. Down Bros., St. Thomas's-street, London, S.E.

NORMAN FLOWER, M.B., B.Ch. Oxf.

THE LANCET.

LONDON, SATURDAY, JUNE 7, 1930

MEDICAL STUDENTS FROM THE UNITED STATES.

THREE documents are appended to the report of the proceedings of the General Medical Council which will be found elsewhere; they deal with the delicate position which has been created, especially during the last two or three years, by the applications from the United States for admission to British medical schools, with the consequent intention to obtain British medical qualifications. The matter was briefly referred to by Sir DONALD MACALISTER in his opening address to the Council, when that body was warned by the President that in some cases the number of these applications exceeded the number of those made at home, thus compelling the Council to look carefully into the educational standards of the applicants lest they should be inferior to those required from British students. The Council accordingly set up a Colonial and Foreign Students' Committee, and from the report of that Committee, which includes memoranda from Sir NORMAN WALKER and the REGISTRAR of the Council, the difficulties of the position will be perceived; and these are so real that the expressions of good will on both sides are particularly welcome.

The American students who are seeking in Great Britain opportunities for education and qualification include those who propose to take the whole of their instruction on this side of the Atlantic and those who desire post-graduate courses. In neither of these cases does any difficulty arise: post-graduate work can be done by all medical graduates, and the only certificate that would be required of the American graduate desiring to go through the complete British curriculum would be one to show that he or she was over 17 years of age upon entrance. But there are two other classes of American students where there is considerable difficulty, and it is from one or other of these classes that nearly all the applications have been received. There are, first, those who having started in an American medical school have failed to maintain their foothold there for various reasons; and, secondly, those who, having completed the American curriculum up to a certain point, are desirous of getting credit for that work in British schools on their way to obtaining a British qualification. In both cases we have to comprehend why in the United States so many students should be unable to obtain the necessary training in their own country, leaving out of consideration those who wish to go abroad from a praiseworthy spirit of adventure. To a great extent this inability is the outcome of the laudable activity of the last few years directed to raising the standard of medical education throughout the States, by suppressing the inferior schools. These used to range from respectable institutions, having often a semi-religious background to their foundation, down to the crudest degree-shops where, in return for so many dollars and the production of a thesis (which might or might not have been written by the man who signed it) a degree in medicine or philosophy or what not could be obtained. A crusade of vigorous reform, steadily carried on in America during the last 15 years or so, has been extremely creditable to the energy of the reformers, who often have had the bitterest opposition from interested corporations or wealthy individuals. The result of this process of cleaning up has been severe pressure upon medical schools attached to the great universities, and it is from the western and middle-western centres of education that those who are unable to carry through the medical curriculum in the States look for accommodation in British institutions. Where the clinical education has not started, but a satisfactory standard from the American point of view has been reached in the ancillary subjects, the British schools are unable to ascertain exactly what that standard has been, or what any particular American high school may demand as a reasonable grounding in biology, chemistry, and physics. This information cannot be obtained categorically from a country where the examination system, as we here understand it, has no existence, yet the General Medical Council, with a certain responsibility for the instruction of British medical students in these subjects, must feel the same responsibility in relation to all students where the object is to obtain a place on the British Register. In the case of students who, having been accepted as sufficiently proficient in these ancillary subjects for admission to an American school, and who seek to continue their education in this country, the procedure is even more delicate. For these students, or many of them, have proved themselves, for this or that reason, unwanted in their American schools, being in the odd position of an honourable suspension. This curious plight is reached by a student who fails to satisfy instructors from year to year sufficiently to obtain promotion from one course of studies to another course of studies, until the position is reached when he or she cannot proceed with the curriculum. The students are examined by their teachers, promoted, deferred, or weeded out, and in the main it is those who have been much deferred who apply to the British schools.

In Sir NORMAN WALKER'S memorandum, the close of which will be found on page 1262 of this issue of THE LANCET, the extreme inconvenience which may result from this situation is set out very clearly; on the one hand, the British schools do not want to earn the reputation of taking in and qualifying those whom the American universities have found unsuitable, nor on the other hand can they continue to irritate American centres of education by providing a portal for qualification which can be entered with shorter preparation than is demanded in the United States. The brevity of the British course is one of appearance only as far as science is concerned, and is due to the pattern of the high-school examinations; but it exists, and creates a situation which has to be dealt with, as the new regulations of the English Conjoint Examination Board appear to recognise.[1] The various documents published this week by the General Medical Council show that mutual arrangement between the educational authorities of the two countries is needed, while the evidence is complete that there is every intention on both sides to reach complete accord.

[1] THE LANCET, April 19th, p. 876.

THE CHLORINATION OF WATER.

CHLORINATION has long been known as a means of deodorising sewage-polluted streams or, with more success, for sterilising drinking water. ROSCOE treated the polluted Thames with bleaching powder, but a study of the rather conflicting evidence leaves it doubtful whether he did much good. In 1905 HOUSTON arrested the development of an epidemic of typhoid in Lincoln by chlorinating the drinking water. During the late war chlorination was largely used as a means of rendering all kinds of contaminated water safe to drink, a technique being devised for the employment either of bleaching powder or liquid chlorine. Since that time chlorination has passed into the routine of many water undertakings, and the shortcomings of the process have been revealed; fortunately the appropriate remedies have in the main also been found. The vast literature of the subject has been reviewed in a conveniently brief sketch by Mr. J. H. COSTE, reprinted from the annual report[1] of the Society of Chemical Industry. From this it appears that chlorination has again been taken up as a treatment for sewage, ancillary to the main processes of purification. The original idea underlying the use of chlorine was its action as an oxidiser, combining with the hydrogen of water, and thus liberating nascent oxygen. But the use of a chemical oxidiser for sewage, when there is available the large and gratuitous supply of oxygen in the air, seems unsound; to be effective enormous quantities of reagent would be required, and the resulting hydrochloric acid might have inconvenient results. Sterilisation of crude sewage is not desirable, as it is better for biological action to reach its utmost useful degree of purification in the works rather than in the diluting stream. Chlorine has however been applied with some success in retarding anaerobic action in long sewers with few branches and a relatively slow flow, when the sewage is fresh enough to form chloro-compounds which have a small but definite sterilising action, sufficient to delay the production of unpleasant odours. Chlorine will, of course, oxidise sulphuretted hydrogen, but it does not seem economical to use it so; it is better not to let H_2S form. The dosage for deodorisation or the prevention of odour is large—up to 20 parts per million. Chlorine has also been found useful for reconditioning filter beds which have become offensive and inactive, and for sterilising final effluents. For the latter purpose the dose must be carefully regulated, or the fish which it is desired to protect from sewage may be killed by chlorine. Judicious use of chlorine may enable sewage works which are reaching their limit of capacity to carry on without extension.

The dose of chlorine required in the treatment of drinking water is much smaller than that used for sewage, and it may be still further kept down by letting suspended matter settle and allowing such self-purification as the capacity of the works and the through-put of water may necessitate. HOUSTON has found that previous chlorination lowers the cost of filtration, but chlorination is apt to lead to the iodoform-like taste which consumers strongly dislike and believe to be unwholesome. In the United States of America the ill-taste is ascribed to chlorphenol, and in some cases, where the staves of wooden pipes have been creosoted or washings from tarred roads get into streams, this ascription may be sound. B. A. ADAMS has shown in our own columns that water-side plants such as willows, alders, and meadow-sweet are likely to yield salicylic derivatives to water flowing past them. Whatever their cause, tastes must be removed if consumers are to be kept contented, and means of doing this have been found. In his last report HOUSTON states that about two million people have (with intermissions due to floods) been supplied with chlorinated water since May, 1916, without any complaint. He has used ammonium sulphate to prevent the production of taste by forming chloramines, and permanganate which may be presumed to oxidise the taste-producing substances; in some cases the latter has given rise to a brown discoloration of colloidal manganese which has led to its abandonment. L. H. ENSLOW, at Toronto, has had success with sulphur dioxide; activated carbon and other sulphur-containing reducing agents have been found effective. A by-product of this work has been the discovery of means to detect and estimate free chlorine and the less active chloramines. Orthotolidine, although a favourite reagent for the purpose, cannot be regarded as specific as it gives a colour with nitrous acid similar to that produced by chlorine; the old test with potassium iodide and starch still retains its popularity. Naphthoflavone, the basis of *Chlortest* Kahlbaum, depends on the use of iodide to produce the blue colour, and seems to have no advantage over starch and iodide.

Any discussion of the action of chlorine on water would be incomplete without an allusion to the chlorination of public bath water, a practice advocated in the pioneer stage by that fearless veteran, Dr. F. W. ALEXANDER. The advantage of clear, sterile water as obtained when chlorination follows filtration, has been set out in the recent monograph[2] on swimming baths by H. T. CALVERT, J. A. GLOVER, and E. A. S. FAWCETT. Chlorination is not a panacea, and SPITTA has wisely pointed out that it should supplement, not replace, the ordinary precautions: a good source of supply and reasonable purification. Chlorination alone might lead to a sense of security which any breakdown would rudely shatter. Nevertheless chlorine appears to have a specific purifying action.

[1] Reports of the Progress of Applied Chemistry, 1929, xiv., 635.

CARE OF THE EYES IN CHILDHOOD.

WITH certain exceptions the diseases to which the eyes of children are liable are to a great extent avoidable. The exceptions are congenital defects, inherited constitutional diseases, and the ophthalmia of the new-born, the effects of which sometimes persist. Even the infective conjunctivitis which occasionally assumes epidemic form in schools could be in large measure prevented by insistence on a rigid hygiene in the matter of towels. Blepharitis is commonly conveyed to the follicles of the eyelids by dirty fingers. Phlyctenular disease, which seldom attacks well-to-do children, owes its origin to the absence of good and sufficient food. Even more important than such external conditions are those that directly affect the sight. These are mainly two, squint and myopia. Internal squint is still too frequent in children of school age, who, when tested, are found to be partially or completely amblyopic in the squinting eye. There has certainly been an improvement in this respect since the establishment of efficient medical inspection in public elementary schools, but

[2] Ministry of Health Special Report No. 32, 1929.

the mischief is often done before the age of compulsory attendance, and among the well-to-do there are still many mothers who look upon a squint as a trivial complaint out of which the child will grow. They are unaware that, unless appropriate measures are taken, by the time the child has grown out of the squint he may also have grown out of the power of using his affected eye. During the only time in his life when it is possible for him to acquire the power of correctly interpreting the images which fall upon the retina it has been impossible for him to do so, and the unused eye has become more or less blind. With regard to myopia, there are cases in which, from hereditary or unknown causes, children become highly myopic at a very early age, but these are comparatively rare, and the defect in vision is so obvious to the mother that they are not likely to remain untreated. Far commoner are cases where a child is born with a predisposition to myopia, or with an astigmatic defect which, from about the time he begins to learn to read, causes him to acquire the bad habit of excessive convergence in order to obtain clear images. The result is an abnormal lengthening of the anterior-posterior axis of the eyes which comes on insidiously. Sometimes mere stooping over lessons may induce this stretching of the eyeball, even without the excuse of astigmatism.

Mr. C. H. BRYANT, who addressed the last meeting of the Brighton and Sussex Medico-Chirurgical Society on the common-sense care of eyes, suggested that the excessive looking at picture books by young children when in the nursery stage is a responsible factor in the production of myopia. This would, we think, only be the case with those infants who have a strong hereditary predisposition to myopia, and it would be a pity to debar normal children from what is, after all, a normal means of educating both eye and brain. The habit of stooping should certainly be checked. In any case, if a child's sight should appear to be weak the eyes should be examined under a mydriatic, when any tendency to myopia would be discovered and appropriate measures taken. From this point of view the establishment of nursery schools with medical inspection is highly desirable. Careful judgment is called for on the part of the doctor in deciding whether or not the constant wearing of glasses is to be insisted on. In the case of the myope, however slight the degree of error, it is probably wise to do so, as this is the most practical method of preventing its increase. That the glasses should be worn for near work is especially important, and this should be explained to the parent who will remark that as far as the child's sight goes the glasses only improve distant vision and not near. In the case of simple hypermetropia, the constant wearing of glasses is only called for in the higher degrees where the distant as well as the near vision is improved by them. In moderate degrees where the child can easily neutralise his hypermetropia by means of his accommodation, it will be sufficient for him to wear glasses for near work or during school hours. In low degrees, or degrees which are low in relation to the age of the child, he will probably be quite as well without glasses at all. When a child's visual acuity is imperfect, and the only defect discoverable is the existence of one or two dioptres of simple hypermetropia, we judge that his accommodation is weak owing to some temporary cause connected with his general health, and it is better to have this put right rather than to prescribe glasses. In the case of astigmatism the decision is not always easy. Considerable degrees, of course, need the constant wearing of glasses and so does any degree of myopic astigmatism. In the case of low degrees of hypermetropic astigmatism, in which the acuity for distance is not materially affected, it will be sufficient in most cases to prescribe correcting glasses for near work, in order to prevent the change from hypermetropic to myopic astigmatism; but there are cases in which even low degrees of astigmatism in children cause symptoms of headache or eye-strain, and these call for the constant wearing of glasses.

Annotations.

"Ne quid nimis."

THE BIRTHDAY HONOURS.

THE following is a list of the Birthday Honours as far as they relate directly to the medical profession. No medical names are among the new peers or baronets.

Knights.

Norman Godfrey Bennett, M.B., B.Ch., L.D.S., President of the British Dental Association.

Harold Delf Gillies, C.B., F.R.C.S., Major, R.A.M.C. (retd.), Chief Plastic Surgeon to the Ministry of Pensions.

Prof. Leonard Erskine Hill, M.B., F.R.S., Hon. A.R.I.B.A., Director, Department of Applied Physiology, National Institute of Medical Research.

Thomas Eustace Hill, O.B.E., M.B., B.Sc., F.I.C., lately Medical Officer of Health in the County of Durham.

Khan Bahadur Behramji Hormasji Nanavati, C.I.E.

John Randall Phillips, O.B.E., M.B., President of the Legislative Council, Barbados.

K.C.B. (Military Division).

Surgeon Vice-Admiral Arthur Gaskell, C.B., O.B.E., F.R.C.S., D.P.H., K.H.S.

Air Vice-Marshal David Munro, C.B., C.I.E., M.B., Ch.B., F.R.C.S. (Royal Air Force, Retired).

C.M.G.

Major Gerald Joseph Keane, D.S.O., M.D., Director of Medical and Sanitary Services, Uganda Protectorate.

Herbert Chavasse Squires, M.D., Director, Khartoum Civil Hospital.

C.I.E.

Major-General Godfrey Tate, I.M.S., Surgeon-General to the Government of Bengal.

Lieut.-Colonel William Jackson Powell, I.M.S., Inspector-General of Prisons, Central Provinces.

Lieut.-Colonel Hugh Reginald Dutton, I.M.S., lately Principal, Prince of Wales' Medical College, Patna.

M.V.O.

Clifford Viney Braimbridge, F.R.C.S.

C.B.E. (Military Division).

Wing-Commander Harold Edward Whittingham, M.B., Ch.B., F.R.F.P.S. Glasgow.

O.B.E. (Military Division).

Major John Hare, M.D., F.R.F.P.S., R.A.M.C.

Lieut.-Colonel James Alfred Seymour, T.D., The Army Dental Corps.

O.B.E. (Civil Division).

John Rhodes Dickson, M.B., Deputy-Surgeon-General and Medical Inspector of Health, Colony of Trinidad and Tobago.

Lieut.-Colonel William Clayton Smales, D.S.O., R.A.M.C., Lately Medical Officer of Health, Gibraltar.

Miss Alexandrina Matilda Macphail, L.R.C.P., Superintendent, Rainy Hospital, Madras.

Hon. O.B.E.

Abdul Al, Medical Officer, Hebron.

Suleiman Saleem, Medical Officer, Jerusalem District.

These honorary distinctions were awarded for services during the disturbances in Palestine in August, 1929.

Kaisar-i-Hind Medal.

Miss Eleanor Isabel Dodson, L.S.A., in charge of the Church Missionary Society Zenana Hospital, Multan, Punjab.

Miss Alice Lucretia Ernst, M.D., in charge of the Ackerman Hoyt Memorial Hospital, Jhansi, United Provinces.

Miss Margaret Mitchell Paterson, M.B., Scotch Mission Hospital, Sialkot, India.

John Edward Sandilands, *M.C.*, M.D., D.P.H., lately Health Officer, Bombay Municipality (posthumously).

Hassan Suhrawardy, O.B.E., M.D., F.R.C.S., Chief Medical Officer, Eastern Bengal Railway.

The following names will be recognised with pleasure in the Birthday Honours, as their owners have worked in relation to medicine in one capacity or another. Among the knights will be found the names of Prof. J. Arthur Thomson, Regius professor in natural history at Aberdeen, and Prof. A. S. Eddington, the famous astronomer. Miss Margaret McMillan has been made a Companion of Honour for services to the nursery school movement. In the Order of the British Empire, Miss Wilhelmine Walker, principal matron of Queen Alexandra's Imperial Military Nursing Service, receives the military O.B.E., while the civil O.B.E. has been awarded to Miss Emily MacManus, matron of Guy's Hospital; to Captain A. G. Elliott, secretary of the London Hospital; and to Mr. Russell Paton, organising secretary of the Royal Infirmary, Edinburgh. The Royal Red Cross of the first class has been awarded to Miss Agatha Mary Phillips, principal matron of Queen Alexandra's Imperial Military Nursing Service, and to Miss Katherine Christie Watt, matron of Princess Mary's R.A.F. Nursing Service. In the same service Miss Esther Wilson Hunter receives the Royal Red Cross of the second class.

REPORT ON THE LÜBECK DISASTER.

Prof. Bruno Lange's report to the German Health Office has appeared [1] with commendable promptitude in order to prevent (in the Elizabethan sense) hasty judgments on a distressing situation. It emanates from the Institute Robert Koch in Berlin with the added authority of Prof. Ludwig Lange. Up to the date on which the report was written 14 deaths had occurred at Lübeck in causal relation with the administration of B C G vaccine; four deaths among this group of infants were due to other causes. Clinically and pathologically the picture was typical of tuberculosis acquired through the digestive tract with generalisation in the internal organs, the portal of entry being the pharynx, nasopharynx, or intestine. Prof. Lange comments on the remarkably short incubation period, about four weeks, death following vaccination within a period of two months; further deaths must be expected for a month or so, as the vaccine was given until the end of April, and it is the administration during March that accounts for the fatal cases so far reported. These cannot be debited to a particular batch of vaccine prepared on a particular day; every batch was alike in its result. If some individual child escaped, this is to be attributed not to the vaccine but to the exceptional resistance of that child or to the accident of the vaccine having been vomited or (conceivably) not having been taken. The mortality was due, Prof. Lange does not doubt, to virulent tubercle bacilli abundantly present in the vaccine. How they got there he cannot say, nor does he hold out much prospect of being able to say, for the original material from the Pasteur Institute as well as the first subcultures are no longer available. A striking feature of Prof. Lange's report is the short work he makes of the supposition that the harmless bacteria in B C G vaccine have regained their original virulence. The experiments which led Pirquet to give up the Calmette method were based on guinea-pigs which were made ill by the injection of very large doses of B C G culture. Petroff's belief that he was able to cultivate virulent bacilli from B C G culture colonies was, he thinks, invalid; the same colonies examined at the Koch Institute showed tubercle bacilli of human type—evidently a contamination, for bovine bacilli are never transmuted into human. The Institute has never been able to detect the slightest enhancement of virulence in many hundreds of vaccinated guinea-pigs, and its series of autopsies on lambs inoculated immediately after birth which showed no trace of the spread of tuberculosis. Isolated records of death in the literature are regarded as equally unconvincing. On this survey of his own work and of similar work elsewhere Prof. Lange rules out the possibility at Lübeck of a spontaneous conversion of harmless into pathogenic form of B C G. This assurance is in harmony with the Belgian report [2] of massive doses of B C G vaccine administered subcutaneously to pregnant guinea-pigs without affecting mortality or development of offspring. But convinced as he is of the harmlessness of B C G Prof. Lange has no illusions as to its proved value. Opinion in Germany is not so optimistic as in France and does not find in the French statistics material for a trustworthy judgment. The protective action of the vaccine in guinea-pigs, rabbits, and monkeys has proved to be very limited, indeed hardly appreciable after oral administration. Whether appreciable success is to be obtained in man is still, he thinks, in doubt; but, he adds, "the slight addition to resistance which we can give to the human subject by means of an immunising dose will in all probability make itself more obvious the higher the grade of natural resistance which the inoculated person possesses." This it is that justifies a test of the Calmette method under State control, the cultures being prepared only in large special laboratories. In the fight against tuberculosis, the report concludes, we cannot afford to discard a remedy in itself harmless from which any result is to be expected.

[1] Deut. Med. Woch., May 30th, p. 927.

[2] Nelis, P.: Bull. de l'Off. Internat., d'Hyg. pub. April, 1930, p. 729.

THE PRESERVATIVE ACTION OF ARSENIC.

THE discovery of arsenic in the bodies of persons who have been poisoned by it after long periods of interment is a well-established fact. The same is true of antimony and in a less degree of other toxic elements. In the tissues generally it is comparatively easy to discover arsenic in such cases, although it may not be found in the chemical form in which it was administered during life, in the alimentary canal especially, owing to the interaction of sulphuretted hydrogen generated during decomposition. Some of it will be in the form of sulphides. In some recorded cases the preservative effect on the tissues was easy to observe. An early instance, narrated in the Annual Register of the Year, 1829, has been brought to our notice by Mr. W. H. Woodzell, of Plymouth. The case occurred at Lyons in 1822, and the facts are briefly these. Suspicion having arisen that death was due to poison administered by the dead man's daughter, two physicians of Lyons, Drs. Ozinam and Ide, were instructed in 1829 by the legal authorities to disinter the body and make an analysis of the remains. Orfila, the famous French chemist, had previously been asked if a body removed from the grave, after the lapse of such a time as seven years, could possibly afford proof of poison having been administered, and, if so, in what manner an investigation was to be conducted. His opinion in reply was that although the body would probably already be reduced to ashes, nevertheless, if a blackish deposit should be found at the sides of the spinal column, chiefly in the dorsal and lumbar regions, it might be analysed in the manner described in his works on toxicology. The coffin containing the remains was entire. It was composed of thick planks of fir or pine, which internally were found to be quite dry. On exposure of its contents, the body was recognised by the priest, by the gravedigger, and by some of the National Guard who had assisted at the

interment and had fired over the grave. It was identified by the hair which yet remained and by the teeth, all of which were still in their sockets except one which had been lost during life. Head, trunk, and limbs were entire, so that the stature could be measured. The chest had fallen in and the heart and lung tissues had become blended together, presenting the appearance of a dark oleaginous substance. The whole was without smell. The entire trunk was then removed—the head and extremities being regarded as unnecessary to the investigation. The portion reserved for examination weighed nine pounds, of which two pounds were set aside for a second set of experiments lest those made on the first should prove unsatisfactory. In the investigation, Drs. Ozinam and Ide proceeded on the supposition that arsenic was the poison.

The matter was first boiled, and the fluid therefrom evaporated to dryness, the residuum thus obtained being dissolved in distilled water. This produced a deep-coloured liquid which, treated with chlorine, was but imperfectly deprived of its colour. The distilled water charged with this extract from the remains was again evaporated to dryness, and four ounces of potassium nitrate, placed in a matras, were exposed on ignited charcoal. The suspected matter well-dried and after rolling it into little portions, was introduced. Each time this was done a deflagration was produced and perceived. It was now allowed to cool and the residue was again dissolved in distilled water. This resulting solution was now saturated with nitric acid and afterwards subjected to the usual reagents, all of which indicated the presence of arsenic. Some small portions were treated with vegetable charcoal introduced into a glass tube and then heated. This gave off aqueous vapour at first, soon after which small grey-coloured and brilliant points were seen. A grain of metallic arsenic was thus obtained. Another portion treated with hydro-sulphuric acid furnished sulphuret of arsenic and this, when heated and acted upon by caustic potash, afforded a portion of shining matter which was easily dissolved in distilled water by directing upon it a current of oxygen gas.

By these various experiments the fact of a considerable quantity of arsenic having been administered seven years earlier was demonstrated. From the ability of witnesses to recognise the features after seven years' burial it is clear that the preservative effect of the arsenic had been remarkable. Since that time other cases have established this effect, which has long been recognised by medico-legal writers. Instances are given in the text-books of Dixon Mann and R. J. M. Buchanan, while J. Glaister cites in detail the appearance of the victims of Flannagan and Higgins who were tried at Liverpool in 1884. By reason of arsenical poisoning having been established in one of the three victims, the bodies of two others—Mary Higgins, aged 10, and John Flannagan, aged 24—were exhumed and examined. Although the body of the former had been buried for about 13½ months, and that of the latter for 37½ months, both were found to be in an excellent state of preservation: indeed, in the case of John Flannagan, the face and body generally could easily be identified. The abdominal organs of Mary Higgins were found on analysis to contain one grain, and those of John Flannagan, 3¼ grains of arsenious acid. Another noteworthy appearance found after burial in the stomach and intestines of the bodies of those to whom arsenic has been administered and which, moreover, was also observed in the bodies of the above-named individuals, is a golden-yellow pigment or coating of the mucous membrane. It has been contested whether this yellow pigment is composed of arsenic sulphide or of yellow bile-pigment. Campbell Brown and Davies analysed the pigment in these cases and found that it did not contain any appreciable amount of arsenic, but chiefly consisted of bile-pigment. On the other hand, Littlejohn and Drinkwater have recorded two cases of poisoning with arsenious acid in which the yellow sulphide was found in the alimentary canal. Like preservative effects on the bodies of victims of poisoning by antimony are also well established. The account of the exhumed bodies in the Chapman or Klosowski case in London (1903) by the late Sir Thomas Stevenson, abundantly shows this. Similar effects had been previously noted in the case of Palmer in 1856, and also that of Captain Caw poisoned by his son-in-law in New Zealand.

A RECEPTION BY THE ROYAL SOCIETY OF MEDICINE.

A WELL-ATTENDED reception was held by the Royal Society of Medicine on May 29th, when Lord Dawson, as President of the society, received the guests with Lady Dawson. In the course of the evening two films were shown; the first, "Turksib," was a Russian picture showing the construction of a railway in Turkestan. This, like other Russian films which have reached this country, was an artistic and clever production. The railway was presented as almost finished, for it was due to be completed in 1930, as the audience was repeatedly told; but in actual fact it is still, we understand, in an early stage of development, and will most certainly not be finished this year. It was interesting to notice that the big machinery being used in the construction was English; also that sheep, cattle, and horses have been imported from England to stock the country through which the railway is to run. The second film was an amusing comedy, entitled "Habeas Corpus," and provided a pleasant contrast to the more serious picture. The popularity of these social evenings has increased to such an extent that many applications for cards have to be refused for lack of accommodation. It is a tribute to the attractions offered by the society that this is true at the very height of the London season.

THE VIRUS OF PSITTACOSIS.

THE claim that certain of the so-called filtrable viruses can be demonstrated by the current microscopical methods is no new one. The bodies described by Paschen, Borrel, and others in virulent vaccinia material are, perhaps, the best known example, but similar appearances have been observed in connexion with other members of the group, such as the viruses of fowl-pox, influenza, poliomyelitis, and dengue. Opinion is sharply divided on the nature of these bodies. They are not easily stained, and do not reveal themselves to casual or haphazard study, which probably accounts for the lack of attention which they have received, many investigators having dismissed them after a cursory examination as precipitate of stain or protein. Nevertheless the view that they are the viruses is held by many whose opinion is entitled to respect. Recently bodies of a somewhat similar nature have been described in connexion with the virus of psittacosis. These appear most commonly as small cocci, 0·2 μ–0·4 μ in diameter, single or in pairs, but occasional bacillary forms are met with which may be as much as 2 μ in length. They are readily demonstrated by prolonged staining with Giemsa, but can be stained, though less well, with Löffler's methylene-blue or carbol fuchsin. Levinthal,[1] who was the first to describe them, does not commit himself on their relationship to other virus bodies, though he does throw out a hint of the possibility of the virus of psittacosis being a member of the Brucella group; apparently he considers these bodies to be the virus. Both Coles [2] and Lillie,[3] whose papers closely followed that of Levinthal, incline to the view that these bodies belong to the rickettsias; in fact, the latter author goes so far as to coin the name *Rickettsia psittaci*. Undoubtedly there are strong resemblances with the rickettsias. The presence of bacillary forms, the appearance of the coccal and bacillary forms when stained by Giemsa, their occurrence in masses inside endothelial phagocytes, and the fact that they are Gram-negative,

[1] Levinthal, W.: Klin. Woch., 1930, ix., 654.
[2] Coles, A. C.: THE LANCET, May 10th, p. 1011.
[3] Lillie, R. D.: U.S. Pub. Health Rep., 1930, xlv, 773.

are all points in favour of this relationship. Then, again, the fact that almost everyone who has studied the virus of psittacosis has seen these bodies suggests that they are something more definite and more readily demonstrated than the Paschen and other virus bodies. Whether this minute cocco-bacillus is the virus of psittacosis remains to be demonstrated, but its constant presence in virulent material, whether coming from man, birds, or mice, makes this more than a remote possibility.

THE TRAINING OF THE DEAF.

THOSE who attended the meeting of the National Institute for Promoting the Welfare of the Deaf which took place last week and to which we elsewhere make reference, had the good fortune to hear from Mr. Stanley Baldwin a very clear exposition of the trials of the large number of people who have lost their sense of hearing. Mr. Baldwin, in a studiously simple address, confined attention to the unsympathetic attitude which the public, through a sort of unheeding ignorance, manifests towards the deaf population, contrasting that attitude with the prompt and deep commiseration which is always extended to the blind. The situation which was described is one of which medical men are becoming increasingly aware, for many doctors are now realising how much can be done for the deaf by classification and suitable education, where full advantage can be taken of the proper training. They will recognise the good sense of Mr. Baldwin's words by as much as they have recognised the possibilities for good work and good citizenship possessed by a large proportion of the deaf. The plight of these is undoubtedly aggravated by the thoughtlessness of those with whom they mix, but the capacities of the deaf require development by methods of education that are hard to come by, and for the provision of which the aid of the State is needed. Expressions of official sympathy have now been received from the relevant Ministers of State under two administrations, and while there is reason to hope that the untiring work of the National Institute will soon bear fruit, towards this end Mr. Baldwin's words of wisdom will play an influential part. By making little organised attempt to train the deaf the State is on the one hand doing little to ease a burden which the country has to bear, and on the other is leaving undeveloped the capacities of a large number of persons perfectly fitted, if only they can be equipped, to help themselves and help others.

THE OBJECT OF A PHARMACOPŒIA.

IN a presidential address to the United States Pharmacopœial Convention, delivered on May 13th, Dr. Reid Hunt quoted from the founders of the U.S.P. in 1820: "It is the object of a Pharmacopœia to select from among substances which have medicinal power those the utility of which is most fully established and best understood; and to form from them preparations and compositions in which their powers may be exerted to the greatest advantage." He suggested how far it was possible to stray from this ideal by recalling the words of another president of the Convention, who had remarked that there were preparations in the U.S.P. no more active or useful than brickdust; and that doubtless brickdust would also be included if a demand for it arose. But though useless drugs or preparations which enjoy a temporary vogue may encumber the Pharmacopœia, they can always be removed by judicial editing; on the other hand, the full value of remedies long known to pharmacologists and doctors may often escape investigation for years. Dr. Hunt cited ether as an example, which was known for nearly 300 years before its anæsthetic use was discovered, and Epsom salt, recognised by the medical profession since 1694, but never examined as an intravenous injection until 1905. The use of carbolic acid as an operative disinfectant by Lister, which was to lead indirectly to the development of aseptic surgery, was suggested to him by observing its action at a Scottish sewage plant—a haphazard origin for a revolution in surgical technique. The moral Dr. Hunt draws from these instances is the need for the rational use of experiment to investigate completely the properties of drugs at present recognised, many of which are still given empirically. The use of anæsthetics once believed to be impossible is now beginning to extend, with the safety and efficiency afforded by modern technique; but Dr. Hunt reproaches surgeons with treating the subject of anæsthesia as though it were a closed chapter, whereas he questions "if man has even got on the right track in regard to general anæsthesia." The effective anæsthetic dose of the substances in use is more than 50 per cent. of the fatal dose—a smaller margin of safety than with any other class of important drugs. And in this view Sir Francis Shipway is in accord, for in a letter on another page of our present issue he describes the position of surgical anæsthesia as very unsatisfactory, and calls for search after an agent which will eliminate the fear of going under, provide a safe induction, and avoid the later complications, whether toxic or irritant. Dr. Hunt holds it probable that in other directions some of the drugs at present in common use have equally far-reaching potentialities. Ehrlich, who combined an encyclopædic knowledge of pharmacology and of organic chemistry, believed that the future of medicine lay in pharmacology. His many contributions to the science were made as the result of patient experiment. The introduction of almost every modern drug into medicine has depended on pharmacological experiments; further, the use of synthetic drugs is rapidly increasing, and to this field of activity it is impossible to imagine a limit. In 1835 Bigelow placed epilepsy and angina pectoris among the "self-limited diseases," declaring that their paroxysms could be neither "foreseen, prevented, nor, as far as we know, materially abridged in their duration." Dr. Hunt referred to the value of the bromides and amyl nitrite, since employed in these two conditions, and mentioned the extreme specificity of action of certain drugs. The destruction of a few cells of the retina, only, by methyl alcohol poisoning was remarkably suggestive; there were possibly a vast number of known but untested compounds which might have a similar effect upon the cancer cells. We have no right to consider any disease "self-limited," or to think it essential to discover the cause before attempting the cure. But, as Dr. Hunt pointed out, "at the present rate of progress it would require not only decades but centuries, perhaps a millenium, for the medical profession to examine what the chemists already have to offer." He left a stimulating impression that no time should be lost in setting about the task.

ROAD ACCIDENTS.

THE harm that is often caused in accident cases on the roads by well-meant but misguided zeal on the part of the public is the subject of a letter addressed to the *Times* of May 28th by the Director of the Home Ambulance Service of the British Red Cross. This applies in particular to cases with fractures of the limb bones; examples are given of patients with a fractured femur taken to hospital in the back seat of tiny cars, and others of simple fracture becoming compound after transport in a lorry without splintage. The British Red Cross Society has done a great deal to minimise the results of the increasing number of road accidents by establishing a network of motor ambulances throughout the country, by educating the people in the principles of first-aid, and by the provision of boxes of first-aid equipment. There is, however, a real danger that the public by its endeavours to help may nullify these efforts. It cannot be too widely made known that in the majority of cases of accident on the road it is far better to

leave the injured person at rest, provided he is kept warm, until a doctor or an ambulance arrives, than to hurry him to hospital without skilled attention to his injured limb. One of the most striking lessons of the war from a surgical point of view was the importance of adequate immobilisation of a fractured limb during transport, and indeed throughout the course of its treatment. That lesson took a long time to learn, and it is now in danger of being forgotten. Its importance applies not only to the transport of the accident case to hospital, but also to the treatment offered on arrival there, where mistaken efforts to clean and comfort the patient by removal of clothing and boots too often produces considerable increase both in local injury and general shock. The new order to London police, by which all detectives up to the rank of first-class sergeant, and all uniformed officers up to the rank of station sergeant, are required to make themselves thoroughly proficient in methods of first-aid, having to obtain a certificate equivalent to that held by members of the St. John's Ambulance Brigade, will do much towards helping the patient who has had a road accident. In spite of the good work of the Automobile Association and Royal Automobile Club, however, there are still too few wayside telephone stations. The provision of these in increased number and the spread of teaching that the best way to help in a road accident is to telephone for a doctor and an ambulance and to be content to keep the patient warm and quiet until their arrival, should do much to minimise the consequences of accidents.

AN INTERNATIONAL CONFERENCE ON MINERS' PHTHISIS.

IT is common knowledge that the organisation of methods to prevent and diagnose silicosis and to estimate the damage sustained by any individual afflicted with it is far more elaborate on the Rand than at any other place in the world. Following a suggestion made by the Transvaal Chamber of Mines and with the generous assistance of this Chamber, the International Labour Office is therefore convening a conference of experts on silicosis to be held in Johannesburg in August of this year. Those taking part will include, besides the men who have acquired unparalleled experience in coping with miners' phthisis in the gold-mines of the Rand, delegates from Australia, Belgium, Canada, Germany, Great Britain, Italy, the Netherlands, and the United States. The conference, which will be under the official patronage of the South African Government, will open on August 13th and will conclude on August 27th. One delegate from each of the countries represented will be asked to prepare a short statement explaining the situation in his country as regards silicosis and closely related dust diseases, the researches made and the results achieved, including particulars of compensation where it is granted. For the rest, the draft programme consists mainly of communications from workers on the Rand, whose papers will be printed and distributed in advance, so that visitors from other countries will be in a position to comment on the information provided and critically examine the statistics and the material collected in South Africa. The communications to the conference will include a historical review of mining conditions on the Witwatersrand from the point of view of dust and ventilation Mr. Hans Pirow, D.Sc., government mining engineer, Mr. A. E. Payne, general manager of one of the mines, and Mr. F. G. A. Roberts, technical adviser to the Transvaal Chamber of Mines, will describe the conditions in the mines in the early days of the Rand and the changes which have since taken place. Mr. A. F. Macewen and Mr. J. Buist will discuss the nature and source of dust in mine air, Mr. James Boyd will give an account of methods for the determination of the amount of dust in mine air, and Mr. Malcolm Fergusson, chief inspector of mines, and Mr. Walter Scott will describe methods for preventing the formation of dust and precautions designed to prevent the inhalation of such dust as may be formed, with the regulations designed to this end. Prof. G. A. Watermeyer and Mr. J. P. Rees will discuss the general question of mine ventilation and air renewal, including references to the heat and humidity problems. The medical aspect of miners' phthisis will be dealt with first by Dr. L. G. Irvine, who will describe the functions and working of the Miners' Phthisis Medical Bureau, over which he presides. Dr. A. Mavrogordato will discuss the ætiology of silicosis and its experimental production, Dr. A. Sutherland Strachan and Dr. F. W. Simson its pathology, and other members of the South African Institute for Medical Research will expound the symptomatology and radiology of silicosis as it affects South African gold-miners. Dr. A. I. Girdwood will describe the medical examination of native labourers on engagement, with a demonstration, and Dr. A. D. Pringle the sanatorium treatment of miners' phthisis. Dr. Andrew H. Watt will speak of silicosis as seen in the days before the establishment of the Miners' Phthisis Bureau. The statistics collected in connexion with the work of this Bureau will be reviewed, also the functions and experience of the Medical Board appointed to hear appeals from its decisions, and the efforts made to provide employment for the sufferers from silicosis and for their dependents. Visits to mines and demonstrations of material and radiograms will be arranged, and the last few days of the conference will be devoted to round-table discussion of questions arising from the previous sessions. The Rand gold-mining industry must inevitably come to an end after a few more decades, since all the reef near enough to the surface to be mined with profit will have been extracted. It would have been most unfortunate if the experience so expensively gained had not been put at the disposal of other nations whose industries include those involving the risk of silicosis, and the idea of convening a conference while the organisation is still at its zenith was a happy one which should have fruitful results.

INDICATIONS FOR MASTOID ANTROTOMY.

THERE is an increasing inclination among otologists to perform the mastoid operation in the later stages of an acute suppurative otitis media. When, somewhere about the fourth week of the disease, a profuse purulent discharge continues without signs of diminution, the majority of aural surgeons now advise antrotomy, even in the absence of other local or general symptoms. If treated conservatively, such cases usually go on to chronic suppuration or, at best, to a scarred fibrosed tympanum and impaired hearing; on the other hand, after the mastoid operation, a soundly healed drum and perfect, or nearly perfect, hearing may be expected. It is surprising what extensive disease may be found under these circumstances, despite the absence of symptoms, though it is possible that careful examination may reveal a fleeting rise of temperature, or a, perhaps very slight, bulging of the postero-superior wall of the meatus. Such is the opinion of Prof. Gustav Alexander, who has recently contributed an interesting exposition [1] of his views of the indications for operation in acute otitis. In the early stage of acute aural suppuration, on the other hand, opinion is hardening against operation. Prof. S. J. Kopetzky, of New York, whose work on "Otologic Surgery" was reviewed in our columns on March 15th (p. 577), believes that the danger of extension to the lateral sinus is increased by operation within the first three days, and that the best results are obtained if operation is performed at the end of this period. Prof. Alexander has long been convinced that the subsequent course of an otitis media is unsatisfactory when the mastoid has been opened in the first week of the disease. In

[1] Wien. klin. Woch., May 8th, p. 577.

his opinion the surgical form of mastoiditis makes its appearance in the third week, just at the time when, in the normal course, the otitis should have healed. He states categorically that there is no such thing as otitis and meningitis beginning simultaneously, and that sinus-thrombosis, like other intracranial complications, occurs at the earliest at the end of the third week. It is true that the duration of the otitis may occasionally appear to be shorter but, on careful inquiry into the history of pain in the neck, or feeling of fullness in the ear, before the onset of actual earache, one finds that the case is really one of otitis in its third week. But, Prof. Alexander maintains, acute otitis produces no genuine complications in the first few days; in severe cases, especially in children, there often appears in the early stage, while the drum is still intact, or before a profuse unobstructed flow of pus has followed paracentesis or spontaneous rupture, a series of symptoms—acute mastoid pain and tenderness with high fever—which imitates, but is distinct from, surgical mastoiditis. This condition is distinguished by the absence of the signs of true mastoiditis; in the latter the soft parts over the mastoid are diffusely thickened, less movable, and warmer than on the opposite side, the tip is obscured by œdema and, above all, there is bulging of the posterior-superior meatal wall. He terms this condition "mastoidismus," but, as he acknowledges that the symptoms are due to an underlying inflammation, the word is open to criticism; it may be better to agree that the mastoid antrum and cells participate in the inflammation of a severe otitis in the early stage. The fact remains that these symptoms disappear when free discharge from the ear is established, that such cases do badly if the mastoid is opened at this stage, and therefore that no operation should be performed beyond incision of the drum-membrane when perforation is absent or insufficient.

THE RESEARCH DEFENCE SOCIETY.

THE report of the Committee of the Research Defence Society is a brief document, reflecting there the fact that the business of the year has been relatively quiet, in spite of the large increase in the numbers of Members of Parliament and public persons whom we hear of as being opposed to the work of the Society. There has been an increasing demand for lecturers and speakers for debates, and a large amount of literature, expounding the benefits to mankind and to animals as well resulting from research, has been distributed gratuitously to the public. But there is one point which emerges from the report which should be brought to the attention of our readers and that is the difficult financial position of the Society. Increased expenditure on publicity has meant, and must mean, a depletion of funds unless the propaganda meets with an increasing number of subscribers. This Society exists for the benefit of the public, its object being to defend medical and scientific research in order that the public may receive benefits therefrom. The attacks of the opponents of scientific progress are directed, of course, not against laymen, whose particular proclivities may not be known, but against the medical profession and institutions like the Medical Research Council. It is therefore particularly to the medical profession that the committee appeal for members, feeling that from this quarter full support should be given to their energies. The support given is disappointing.

At the annual meeting of the Society, held at the rooms of the Medical Society of London on June 3rd, Lord Lamington presiding, Sir Leonard Rogers, as honorary treasurer, pointed out that during the last four years expenditure had exceeded income by over £400. Mrs. May Mellanby delivered the fourth Stephen Paget memorial lecture on "Diet and Dental Disease: what we have learned from Animal Experiments." She showed that all fundamental facts upon which current hypotheses concerning correct feeding had been based were discovered by animal experimentation. The average human being in this country was fed, especially during childhood, on just those diets which had been found to produce defective teeth and defects in related tissues in animals—i.e., large amounts of cereals, with comparatively little whole milk, egg yolk, and other foods which contained fat-soluble vitamins. The profession was now aware of some of the worst errors committed in feeding, and in feeding children especially, and so long as these errors were persisted in, so long, she submitted, would the teeth of civilised man remain in their present deplorable state. In the course of the discussion Col. F. E. Fremantle, M.P., said that he had asked the Minister of Education in the House of Commons whether he would bring to the notice of children in schools the researches of Mrs. Mellanby, and the reply was a copy of the handbook issued on diet. He suggested that this handbook might require some modification in view of recent researches, and Mrs. Mellanby concurred. The difficulty in regard to public propaganda at the present time was that much appeared in the lay press which was untrue, and that made it even more difficult for those who had not scientific habits of thought to discern the accepted facts. She might have added that even in scientific circles there is not yet agreement on the theoretical significance of dietary experiments and still less on the precise way in which their lessons could be translated in didactic advice in handbooks. It is just at this stage that the patient work of a body like the Research Defence Society, whose sole object is to impress the public with the need of further experimental research, is valuable. Its work is neither pleasant nor easy, and should not be further hampered by lack of financial support.

IT is announced that the Rockefeller Foundation has offered £100,000 to the University of Sydney for provision of laboratory facilities in the departments of surgery, pathology, bacteriology, and allied subjects.

THE Cavendish lecture of the West London Medico-Chirurgical Society will be given at 8.15 P.M. on Tuesday, June 17th, by Prof. Fritz de Quervain, of Berne, who will speak on Cretinism and its Relation to Thyroid Physiology.

THE Croonian lectures will be delivered at the Royal College of Physicians of London at 5 P.M. on June 12th, 17th, and 19th, by Sir Charles Martin, F.R.S., Director of the Lister Institute. His subject will be the Thermal Adjustment of Man to External Conditions, more particularly those pertaining to Warm Countries. Members of the medical profession will be admitted on presentation of their cards.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Courses have been arranged in the following subjects: Gynæcology, at the Chelsea Hospital for Women, certain mornings and afternoons from June 16th to 28th; dermatology, at the Hospital for Diseases of the Skin, Blackfriars, each afternoon, between same dates; medicine, surgery and the specialties, daily, 10.30 A.M. to 5.30 P.M., between same dates; proctology, at St. Mark's Hospital, City-road, daily, from June 30th to July 3rd. Detailed syllabuses of all courses can be had from the Fellowship at 1, Wimpole-street, London, W. 1.

LONDON TEMPERANCE HOSPITAL. — Re-building operations have been begun at this hospital. Four additional storeys will be added to the out-patients' department, and the pathological and massage departments will be housed in better quarters. There will also be a new radiological department, a lecture room, private wards for paying patients, and new quarters for nurses. The cost of rebuilding will be £45,000, towards which £11,000 is in hand or promised. During the week ending May 31st, 21 new in-patients were admitted and over 1340 attendances were made at the out-patients' departments.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles Contributed by Invitation.

LXXV.—CHEMICAL TESTS OF PANCREATIC EFFICIENCY.

PART I.*

As in the case of the kidneys (see THE LANCET, 1928, ii., 1092) certain general principles must be considered when testing the functional efficiency of the organ. The tests yield abnormal results only when the disease of the organ is extensive. The gland possesses a large "reserve power" and in interpreting the results of tests the possible influence of non-pancreatic factors must be considered, and in particular the likelihood of coincident disease of the liver or bile-passages.

Functions of the Pancreas.

The functions of the pancreas include (1) the formation of the internal secretion ("endogenous insulin"), and (2) the formation of the external secretion (pancreatic juice), which contains enzymes (or zymogens) acting on each of the three classes of foodstuffs—viz., amylase or diastase (carbohydrates), trypsin (proteins), and lipase or steapsin (fats). It is difficult to examine these secretions because of the inaccessibility of the gland; examinations must of necessity be conducted on the duodenal contents, gastric contents, fæces, blood, or urine.

Tests of Deficiency of Internal Secretion.

Hyperglycæmia and glycosuria.—Glycosuria is uncommon in diseases involving the pancreas as a whole, and particularly in chronic lesions. In acute hæmorrhagic pancreatitis, slight transient glycosuria and hyperglycæmia are fairly often found and are valuable in diagnosis, but there is rarely time to make estimations of blood-sugar. In chronic diseases of the pancreas, it is worth while to obtain data for a blood-sugar curve, but the result is often within normal limits, because hyperglycæmia does not occur till a very large proportion of the islets of Langerhans is damaged. A normal curve, therefore, does not exclude pancreatic disease, and when an abnormal curve is obtained it is necessary to consider the possible influence of other factors.

Loewi's test.—The pupils of both eyes are carefully examined, noting their size and their reaction to light and accommodation. Two drops of 1 in 1000 adrenaline are instilled into one eye, the other being left untreated for comparison. The pupil of the treated eye is examined at intervals of about 15 minutes for the next hour, and compared with that of the untreated eye. Normally the adrenaline causes no change in the pupil. The reaction is positive if the pupil dilates. In positive cases the pupil is often oval and the dilatation eccentric. Several attempts to explain this observation have been made, of which two may be noted: (1) The "hypoinsulinism" produces a relative hyperadrenalism which increases the sensitivity of the sympathetic system, wherefore the pupil reacts to the instillation of adrenaline. (2) Inflammation of the pancreas causes irritation of the solar plexus, wherefore the autonomic system is hypersensitive.

The test is not specific because positive results have been obtained in hyperthyroidism, and in diseases of the gall-bladder or of the bile-duct. The latter observation might be "explained" on the basis of coincident pancreatic disease, but obviously limits the clinical value of the test. Negative results have been obtained in typical examples of acute pancreatitis. Some writers speak highly of the reaction in acute disease, others have discarded the test. It is so simple that it is worth performing in parallel with other tests, so long as its limitations are remembered. It is very rarely positive in diabetes mellitus.

Tests of Deficiency of External Secretion.

Theoretically tests might be applied for the different enzymes, or evidence might be sought of incomplete digestion of foodstuffs owing to deficiency of these enzymes. Examination of gastric contents, of duodenal contents, of fæces, of blood or of urine might be utilised. In practice many of these points of attack are of limited or no value, as will readily be understood if the presence of other enzymes in the alimentary tract, the action of bacteria, the influence of diarrhœa, and so forth are remembered. It is convenient to discuss the methods under the heading of each enzyme in turn.

Carbohydrate-splitting ferment.—Examinations of gastric or duodenal contents are useless owing to the presence of salivary ptyalin. Examination of the fæces has also proved disappointing, owing to the action of bacteria, or the presence of diarrhœa. Estimation of diastase in the blood is of limited value. Normally, tested by Wohlgemuth's method (see below), the blood contains 3 to 10 units of diastase. In acute pancreatic disease the amount is increased, but owing to its rapid excretion urine examination is much more satisfactory.

Estimation of diastase in urine has proved a useful test of pancreatic efficiency, although it is still not decided whether the diastase is derived solely from the pancreas. Wohlgemuth's is the method usually employed.

A Wohlgemuth unit is the amount of diastase which will digest 1 c.cm. of 0·1 per cent. soluble starch (1 mg.) in 30 minutes at 37° or 38° C. to such a degree that no blue colour is obtained on adding iodine. The diastatic index is the number of units in 1 c.cm. of urine. It is important to adjust the reaction (pH) of the urine to the optimum for the enzyme. In health the concentration of diastase in the urine, or the diastatic index, is 6·7 to 33·3 units. Occasionally when the urine is concentrated the index may rise as high as 50 units. The day's output of diastase is the product of the volume of the 24 hours' urine in cubic centimetres and the index. Normally the day's output varies from 8000 to 30,000 units.

An index of 50 is suspicious, and of 100 is almost always definitely abnormal. In acute pancreatitis values of 100, 200, and even up to 2000 may be found. In chronic pancreatitis and in carcinoma of the pancreas the diastatic index is usually normal or low, but sometimes in carcinoma the index may rise to about 100. In severe trauma of the pancreas the urine not uncommonly contains an increased concentration of diastase (up to about 200 units), and the finding of high indices in the urines of patients who have had a blow in the abdomen is useful clinically. It has been claimed that the index is often high in the toxæmias of pregnancy, and it has been suggested that the cause of this is an increased permeability of the kidney. In many cases, however, the index is normal (though rarely, if ever, low). In eclampsia indices of 50 to 100 are fairly common, and very occasionally even higher values are obtained. It is possible that these figures are mainly, if not entirely, due to oliguria. In diabetes the diastatic index is almost always normal or low.

Estimations of diastase should be made on the 24 hours' urine, except in acute pancreatitis. Normally, owing to polyuria (drinking, cold, and so on), or oliguria (sweating, restricted fluid intake), there are considerable variations in the diastatic index of specimens taken at different times of the day, though this range of variation rarely exceeds 2 to 50 units. For this reason the 24 hours' sample is employed, and when this is done the variations in different healthy individuals usually fall to the figures (between 6·7 and 33·3 units)

* Part II. will appear next week.

already indicated. In acute pancreatitis, diagnosis is so urgent that 24 hours cannot be allowed for collecting the urine, and the first obtainable sample is used. Fortunately, in genuine cases of the disease such a sample usually contains 100 or more units per 1 c.cm., but lesser concentrations of diastase are obviously not significant.

The increase of diastase in the blood and urine in pancreatic lesions may be due to obstruction of the ducts, or to increased permeability of the pancreatic cells due to inflammation. These hypotheses fit in with the clinical observation that the urinary diastase is increased when the ducts are obstructed or when inflammation is acute, and is normal or low in chronic sclerosing conditions. I. Cohen and E. C. Dodds have shown that the same variations in the diastatic index are found in starvation as after food, so that presumably diet has no influence on the output of the enzyme.

There may be a transient increase of the concentration of diastase in the urine when a salivary duct is obstructed or a salivary gland is acutely diseased, but such a cause is readily recognised from the clinical examination of the patient.

If there is a deficiency of the external secretion of the pancreas, it might be expected that a certain amount of starch might escape digestion and be recognisable in the fæces, but microscopical examination of the stools for starch granules has been found of no value as a test of pancreatic function. Starch granules are often absent in proved pancreatic disease, and are not uncommon when there is gross diarrhœa or the subject is ingesting large quantities of starchy foods.

Protein-splitting ferment.—Either the *gastric* or the *duodenal* contents may be examined for trypsin. A positive result excludes complete obstruction of the pancreatic ducts, but a negative result in either fluid is not conclusive. It is unlikely that quantitative estimations will be of any value owing to the unknown degree of dilution. Regurgitation of duodenal fluid into the stomach is uncertain, but it has been suggested that the reflux might be provoked by administering 0·4 per cent. hydrochloric acid. Generally, however, direct duodenal intubation is employed. When examining the gastric contents for trypsin it is, of course, essential to make the reaction alkaline.

Examination of the *fæces* for protein-splitting ferments has proved disappointing. In a certain number of healthy individuals no such enzyme can be detected, and in the rest, when quantitative methods are employed and the results are expressed in terms of the dried fæces, a wide range of variation is obtained. It would appear, therefore, that results characteristic of pancreatic lesions do not exist. Examination of the *blood* and *urine* for trypsin is of little or no value.

If the external secretion of the pancreas is deficient it might be expected that the fæces would contain more protein and protein-products than normally, though the action of intestinal erepsin, and of bacteria, and the influence of the rate of passage of the intestinal contents are all obvious complicating factors. Whilst it is true that the total nitrogen expressed as a percentage of the dried fæces is increased in gross pancreatic disease, such a wide range of variation is found in other pathological conditions—gastro-intestinal disease often giving quite as high values as pancreatic disease—that the estimation is of little or no value. A proper metabolism experiment in which the intake and output of nitrogen are measured gives more information, but is not a practical proposition in routine clinical work.

Microscopical examination of the fæces for undigested muscle-fibres is a simple qualitative test of some value, but it is important to realise what constitutes "creatorrhœa," or the passage of undigested meat fibres. The connective tissue binding the fibres together is digested by the gastric juice, so that pancreatic trypsin acts on individual muscle-fibre fragments. There results seriatim the disappearance of the nuclei, the rounding of the ends of each fragment, and the disappearance of the transverse striations, leaving round yellow-brown fragments, which may either show a faint longitudinal striation or may appear quite homogeneous, and finally the complete disappearance of muscle-fibres. Fibres with rounded ends, but visible transverse striations are not uncommon in simple diarrhœa. The discovery of numerous fibres with irregular ends and well-marked striations ("true creatorrhœa") almost always points to a deficiency of pancreatic trypsin, but their absence does not exclude a gross lesion of the pancreas, since other protein-splitting ferments (intestinal or bacterial) may cause partial or complete digestion of muscle. The only things likely to be mistaken for muscle-fibres are the woody fibres of certain vegetables. There is rarely any serious difficulty, however, because the striations of the woody fibres are much coarser, more irregular, and more refractile. Naturally, when the observations are made, the patient must be consuming meat or poultry. Some investigators have claimed that better results may be obtained with special test diets, but for routine clinical work an ordinary hospital diet, containing meat, is generally satisfactory.

Fat-splitting ferment (lipase).—Tests for lipase in gastric contents, blood, or urine are of little or no value clinically, but examination of the duodenal contents for lipase is sometimes useful. As in tests for trypsin in duodenal fluid, a positive result excludes a complete obstruction of the pancreatic ducts, but a negative result is not conclusive evidence of the presence of such obstruction. Tests for the two ferments should be run in parallel. Tests for lipase in the fæces are of no value, because the lipase is destroyed by trypsin, but microscopical examination of the stools and a differential estimation of fat in fæces are generally recognised as of value in pancreatic disease.

General Appearance and Microscopical Examination of Fæces.

The passage of bulky stools is a well-recognised clinical feature of pancreatic disease, though other conditions may cause bulky stools—e.g., obstructions of the bile-duct, cœliac disease, sprue, congenital steatorrhœa, gastro-colic fistula, and mesenteric tuberculosis involving the lacteals. Bulky, watery stools, due to diarrhœa are easily differentiated. The stools in the above diseases are not only bulky, but fatty in appearance, owing to the presence of an excess of fat. The passage of fatty stools, which are liquid when passed and set solid on cooling, constitutes "true steatorrhœa," though the term steatorrhœa is often applied to the passage of any fatty stool, even though it does not solidify on cooling. True, steatorrhœa is apparently diagnostic of pancreatic defect (except possibly in congenital steatorrhœa). The fresh stool consists of fæcal material floating in molten oil, and on cooling the fæcal matter forms a plate.

Microscopical examination is useful, not only to check the macroscopical appearance of fat, but also to give a rough idea of the type of fat (neutral fat globules, fatty acid crystals, soap plaques) present. When there is a deficiency of the pancreatic juice, it is the splitting of the fats which is defective. Hence the excess of fat is chiefly in the form of neutral fat. On microscopical examination, therefore, oily globules, but not an excess of fatty acid crystals or of soap plaques, may be found in a typical uncomplicated case. In clinical work, however, cases of combined pancreatic and liver disease are commoner than those of pure pancreatic disease, wherefore the microscopical findings are often not "typical." Moreover, the neutral fat is often so finely divided that it is not readily seen under the microscope, and when oily globules are visible it is important to exclude liquid paraffin and other oily drugs as their source. The results of microscopical examination therefore can only be interpreted in the light of the clinical examination. Lastly, even in the complete absence of pancreatic juice the neutral fats may be hydro-

lysed lower in the gut by bacteria, for which reason the absence of a "typical" microscopical picture by no means excludes the existence of pancreatic disease.

In the laboratory, one of the chief reasons for making a microscopical examination is to decide whether or not the laborious analysis of fæces for fat is worth undertaking. If, macroscopically, the fæces are nor bulky and not fatty-looking, and if microscopically, no fat globules, no fatty-acid crystals, and only occasional soap plaques are seen, then chemical analysis is certainly a waste of time.

Fat in fæces.—Normally, of the dried fæces, not more than one-fourth to one-third is fat, and of the fæcal fat not more than one-fourth to one-third is unsplit. In typical pancreatic cases the total fat percentage is excessive, often over 50, and the splitting is defective, the unsplit neutral fat being 40 to 70 per cent., or even more, of the fæcal fat. But, as indicated in the last section, such typical results are the exception rather than the rule, and the finding of a high percentage of total fat of which the greater proportion is "split" (free fatty acids and soaps) does not by any means exclude pancreatic disease. Differentiation between free fatty acids and soaps is of no value, since the reaction of the fæces is the chief factor influencing the proportion of fatty acids which is combined as soaps.

G. A. HARRISON, M.D. Camb.,
Reader in Chemical Pathology in the University of London; Chemical Pathologist to St. Bartholomew's Hospital.

IN Dr. John Freeman's article on the Significance of Idiopathic Skin Reactions (Part II.), which appeared on page 1197 of THE LANCET last week, the first paragraph, which preceded the list of asthma-group diseases, should have read as follows:—

"In Part I. of this article it was made clear that we can produce a long list of symptoms by applying grass pollen to the hay-fever subject in various ways. Let us make a list of these hay-fever 'symptoms,' for they are identical with the 'diseases' (produced by various protein irritants) which we are to test for by skin reactions."

DONATIONS AND BEQUESTS.—Mr. Clemont A. Ravenscroft left, among other bequests, £30,000 upon trust for his brother Leonard for life, with remainder on his decease equally between St. Mary's Hospital, King's College Hospital, St. George's Hospital, Charing Cross Hospital, and the London Hospital.—Colonel Arthur Bray, T.D., of Church Lane House, Adel, Leeds, left £1000 each to the Leeds University and Leeds General Infirmary.—Mr. P. Breda Vander Byl left £1000 to the London Hospital, among other bequests.—Mr. George Strachan, of Ellisland, Pollockshields, Glasgow, left, among other bequests, £2500 each to the Glasgow Royal Infirmary, the Glasgow Western Infirmary, the Glasgow Victoria Infirmary, and £2000 to the Glasgow Royal Hospital for Sick Children; £1500 to the Elder Cottage Hospital, Govan; £500 each to the Glasgow Eye Infirmary, the Princess Louise Scottish Hospital for Limbless Sailors and Soldiers, the Ralston Auxiliary Hospital, the Royal Samaritan Hospital for Women, Glasgow, the Glasgow Royal Cancer Hospital, the Glasgow Ear, Nose, and Throat Hospital, the Glasgow St. Andrew Ambulance Association, and St. Dunstan's Hospital for Blind Soldiers and Sailors.—Sir Ralph Collingwood Forster, Bart., of Sutton, left £5000 to the Sutton Hospital (or such part as he had not given since the date of his will, Feb. 28th), for general purposes, and £1000 each to the Surrey Convalescent Home for Women at Bognor, the Surrey Convalescent Home for Children at Bognor, and the Surrey Convaleseent Home for Men at Seaforth.—Colonel Sir William E. C. Currie, of Itton Court, Chepstow, among other bequests left £1000 to the Newport Hospital and £1000 to Chepstow Hospital.—Mr. Clement Arrol Ravenscroft, of Westbourne-terrace, Paddington, left £500 to St. Dunstan's Hostel for the Blind; £30,000 on trust for his brother Leonard for life, with remainder on his decease equally between St. Mary's Hospital, King's College Hospital, St. George's Hospital, Charing Cross Hospital, and the London Hospital.

Special Articles.

NATIONAL INSTITUTE FOR THE DEAF.

THE annual meeting of the National Institute for the Deaf was held at the Church House, Westminster, on Friday, May 30th, the President, Lord Charnwood, in the chair. After welcoming Mr. Stanley Baldwin, who had promised to address the meeting, and who was present at great personal inconvenience, the chairman referred to the progress of the Institute. It had, he said, been steadily growing in influence since their last meeting, while efforts which had been made to get the importance of the cause sufficiently realised by the public had begun to tell. During the last 12 months, for example, a scheme had been framed, and was now ready to be launched, for supporting a school for the higher education of congenitally deaf people, and promises of financial support to it had already been received. Plans had also matured for starting in London a centre for social intercourse, and once these were under weigh the deaf, first in London and thence elsewhere, would help themselves and one another, and the necessary financial support, he thought, would soon be found. Much headway had been made in promoting local organisations, and such work could only be done thoroughly by the Institute itself. As to the result of pressure upon the last administration, it was entirely due to the Institute that anything was done; now the Minister of Health agreed with the Minister of Education, and would make an inquiry for himself through an experienced official in whom there was complete confidence. The conditions of the deaf and the measures necessary for the removal of some of their difficulties would follow, he thought, on the sort of public inquiry which was desirable being held. The problem of the deaf was now before the minds of our rulers in a way and to an extent which it was not when the annual meeting of the Institute was held last year.

Mr. Baldwin's Appeal.

Mr. Baldwin said he would try to put in a few words what were the disabilities of the deaf, and at the same time to arouse the sympathy of the outside public, so that they would be ready to help the Institute in its admirable work. The outside public had very little realisation of the tragic fate of the deaf. He was not thinking so much of those who were born so, tragic as their case was, but the public should be careful not to confuse the special teaching, given to those born deaf, with the requirements of the ordinary deaf.

The first thing that struck him—it was most unfair and he did not know the reason—was the complete difference in the treatment of those who were blind and those who were deaf by the outside world. Blindness was a most terrible affliction, but from the dawn of history it had been met by those who were not blind with a consideration and kindness which went far in the alleviation of the lot of the sufferers. Every allowance was made for them; everyone was ready to help them across the road; everybody was ready to talk to them and tell them of things; and they had open to them all the resources that modern science could bring to their delectation in the way of speech and music. If the blind had lost their sight in later life they had the recollection that nothing could take from them: the beautiful sights of this earth and the faces of their friends who could talk with them, while they could hear the voices of their fellow creatures. There was a gulf of isolation between their fate and the fate of the deaf. There seemed to be very little natural sympathy for deafness, and that arose from want of thought and want of imagination. One never heard a joke made at the

expense of the blind; pantomimes and ordinary conversation were full of jests at the expense of the deaf. If people were short-sighted and wished for a book or a picture to be brought nearer to them in order that they might see better, one did not shout at them "*Can't you see? Are you blind?*" But if people were asked to repeat a remark, the reply might often be "*Can't you hear? Are you deaf?*" This lack of sympathy could be found in every place, in every country, and at all times. Mr. Baldwin said he was thus calling attention to the obvious in the hope that his words might lead to a little more consideration, and a little more courtesy being shown to those who suffered from deafness. With the totally deaf the prospect was appalling. It would be indecent on the part of anyone who still had command of his faculties to ask which was the greater deprivation, sight or hearing. Both were terrible, but he had often thought that there could be no more awful fate than to be completely cut off from ordinary daily intercourse with human beings, and that of course was what complete deafness meant. Those who were not deaf ought to realise that deafness did not always mean just complete silence and oblivion; it was often accompanied with distressing noises in the head and troubles which anyone who had suffered from temporary deafness would never forget. When the deaf could hear by the aid of appliances, how different again was their fate from that of the blind. Everyone was eager to help and converse with them. There was not one person in a hundred who would go voluntarily to speak to a deaf person by the aid of an instrument. People made for the other side of the room, which must cause the deaf a great deal of unnecessary pain. People, when they talked to the deaf, became, as it were, paralysed; their conversation became unnatural and stilted. The moment that deaf people got to the point when artificial aids must be employed, they were in a slow process of being immured alive; they were cut off completely from contact with their kind. That was a very terrible fate, and everything should be done to lighten it for them. There was no better way to begin than by altering our behaviour towards deaf people, assimilating it to our behaviour towards the blind. As with the blind, very often the sense of hearing and the power of memory became more acute; he imagined that with the deaf, the sense of sight and the power of memory grew. To those who became deaf late in life that which came to them through the eye must be of growing importance all through their lives. With such training as Lord Charnwood had alluded to, the deaf subject could be taught an appreciation of the beautiful things of this world; and if music should be cut off from them, why should they not learn to derive an equal pleasure from the sight of beautiful things, of books, works of art, and the scenes of nature? "The deaf and the blind alike need our help," he said, "and to remedy the deficiency let us try to open for them, as far as we can, those deeper and permanent spiritual possessions which would never fail, and which would last to the end of their days."

Major Bonn, the son of the late Mr. Leo Bonn, the virtual founder of the Institute, then proposed a vote of thanks to Mr. Baldwin, which was seconded by Sir Squire Sprigge, and briefly replied to.

Report and Formal Resolution.

The report and statement of accounts which showed a deficit of £115 for the year ending March 31st, 1930, had been circulated to the meeting, but they were summarised by Mr. A. J. Story, the hon. secretary, and Mr. W. G. Yates, the hon. treasurer, respectively. On being put to the meeting by the President and seconded by Mr. M. Birley, chairman of the executive committee, the report and statement of accounts were carried unanimously.

Sir Harry Stephen proposed and Mr. Yates seconded an amendment to the articles of Constitution enlarging the composition of the executive committee with the object of giving greater representation to Counties Associations. This having been agreed to, on the motion of Admiral Sir Edward Bradford, the thanks of the meeting were given to the honorary officers of the Institute, who were confirmed in their several capacities.

Mr. Myers, one of the honorary auditors, submitted a resolution acknowledging the services of the executive committee, and suggesting the following names for election to that body:—Sir Harry Stephen, Rev. F. W. G. Gilby, Rev. A. Smith, The Hon. Mrs. John Tennant, Miss H. Davids, Miss M. Hare, Miss B. Neville, Miss F. M. Townsend, Dr. C. Heath, Dr. D. A. H. Moses, Major F. J. Wegg Prosser, Mr. E. Ayliffe, Mr. S. A. N. Oxley, Mr. C. Shaw, and Mr. A. W. Taylor be elected for the ensuing year.

In seconding this resolution, Col. F. E. Fremantle emphasised the need for keeping the welfare of the deaf constantly before the Government, while there remained the necessity for medical research into the causes of deafness and the means for its prevention.

The proceedings closed with a vote of thanks to the chairman.

IRELAND.

(FROM OUR OWN CORRESPONDENT).

The Sweepstakes Bill.

THE "Sweepstakes Bill" has now passed both Dail and Senate, and only awaits the signature of the Governor-General to become the law of the land. While the opposition to the Bill failed to have any effect in either house, it cannot be claimed that there is any enthusiasm for the measure, or any genuine hope that it will remove the difficulties of the Dublin hospitals. The real financial position of the several hospitals is unknown except to those in the inner circle of each institution. Most of them exhibit overdrafts, but few exhibit as openly a statement of their assets. This may be good propaganda, but it makes understanding of the hospital problem impossible. Suggestions were made in the debates in the Dail and Senate that a thorough investigation of the financial position of the several hospitals is desirable. If this is to be done it would be preferable that it should be undertaken by the hospitals themselves rather than by any external authority. It would seem that even a preliminary survey would be helpful, before any sweepstakes are promoted. If the several hospitals which are in genuine need were to pool their influence in promoting a joint sweepstake, it is possible that their immediate needs might be satisfied. If half a dozen institutions promote sweepstakes independently, none will benefit to an appreciable extent, and the general problem will be unchanged. Moreover, the common belief that sweepstakes are an unfailing resource is certain to interfere with what must remain the chief normal source of hospital income—the charity of the benevolent.

Royal College of Surgeons in Ireland.

Mr. Richard Atkinson Stoney has been elected President of the Royal College of Surgeons in Ireland. He had been vice-president for the past two years. Mr. Stoney is a graduate in medicine and surgery of Dublin University, and has been a Fellow of the Royal College of Surgeons in Ireland since 1906, and a member of the Council of the College for several years. He is senior visiting surgeon to the Royal City of Dublin Hospital, and is at present President of the Section of Surgery of the Royal Academy of Medicine in Ireland. Mr. Frank Chetwode Crawley has been elected Vice-President of the College. He is a graduate in arts of Cambridge University and in medicine and surgery of Dublin. He has been a Fellow of the Royal College of Surgeons in Ireland since 1900. He is ophthalmic surgeon to the Royal City of Dublin Hospital, and surgeon to the

Royal Victoria Eye and Ear Hospital. He held the post of surgeon dentist in ordinary to the Lord Lieutenant during the Vice-Royalty of Lord Aberdeen. He is at present president of the Ophthalmological Society of the United Kingdom.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Bacterial Aftergrowth in Water.

SOME cities in this country are suffering from what appears to be a growth of bacteria in the water-supply after it has passed through the plant for filtration and/or chlorination. When the multiplying organism happen to be the colon bacillus a difficult situation arises. The possibility that pollution is occurring is naturally the first thought, but even when this possibility appears to be rigorously excluded at any given time, the sanitary engineer is still faced with the difficulty that his most trustworthy method of detecting pollution at any subsequent date is removed so long as the bacterial aftergrowth continues. In an attempt to investigate the extent, and, if possible, the cause of this phenomenon, a questionaire was recently sent out by the American Public Health Association to 90 cities with a total population of 30 millions. Replies were received from 48 cities representing a total population of 25 millions. Fourteen cities with an estimated population of nearly 16 millions reported that they had had or were having trouble with bacterial aftergrowths. Among these cities there are 48 open reservoirs in use. The Committee on Water Supply of the A.P.H.A. recommends that water departments apply themselves to a study of these reservoirs with the hope that their number may be reduced to a minimum. However, there is evidence that open reservoirs are not the sole source of multiplying colon bacilli. Five cities state that there is increase in these organisms in the distribution system from sections where there is no possibility of the water coming from an open reservoir. Obviously there is need for more intensive investigation, and now that the problem has been defined such investigation will soon follow.

The Falling Death-rate.

The record in low mortality established in the the first three months of this year by the Metropolitan Life Insurance Company is attributed in their statistical bulletin in part to the absence of any epidemic, but also to an all-round reduction with especial improvement for such important diseases as influenza, tuberculosis, pneumonia, diarrhœa, and chronic nephritis. The drop in tuberculosis has been so pronounced as to make it almost certain that a new minimum will be reached for this disease in 1930. The rate for white policy-holders for the first quarter is 65·3 per 100,000, and this is 10 per cent. lower than the previous lowest period for the first quarter. The death-rate from alcoholism shows a marked drop and for once cancer deaths are on the decline. Accidents as a whole remain in statu quo but automobile fatalities continue to increase steadily. Among the contagious diseases measles has been very prevalent of late, but fortunately the death-rate does not yet show a marked increase. Epidemic cerebro-spinal fever is more prevalent than it has been for some time.

Maternity in Dollars.

The present fashion for medical cost-accounting has produced two studies recently in the expense involved in childbirth. A professor in the Ohio State University finds that the cost of a baby in Columbus, Ohio, varies from nothing at all to $692. The average expense to parents with an income of $3000 or more is $270; for those with an income of $1200 to $3000 it is $129; and for those whose income is less than $1200 it is $64. The investigator concludes that only the well-to-do and the dependent have medical care at childbirth that approaches modern standards of obstetrics. Others would purchase competent medical care if they had the means to do so.

Another study [1] comes from Berkeley, California, both of them covering the year 1928. The average cost in Berkeley was $213 per baby. In half of the cases the cost was $179 or less. Almost 10 per cent. were charged no physician's fee. The mean cost of the physicians' services was $92, and the mean cost of midwives $33, while the mean cost of trained nurses amounted to $116. The other important item in the bill is hospital room $82, or ward $62.

SURGERY IN AUSTRALASIA.

EXAMINATIONS AND ETIQUETTE.

THE annual general meeting of the College of Surgeons of Australasia was held in Melbourne from March 24th to 27th. About 170 Fellows from all parts of the Commonwealth and New Zealand attended.

The Australasian and English Fellowships.

In his inaugural address, the President, Sir Henry Newland, of Adelaide, referred to the qualifications for admission to Fellowship of the college. It was probable, he said, that in the future, the ranks of the Fellows of the college would be replenished chiefly by young men who, soon after graduating, decided to undergo special training for the practice of surgery, which was insisted upon in the constitution of the college. Such candidates would be required to have one year's training as house surgeon or house physician, one year's training as senior resident officer at a special hospital, a general surgical qualification recognised to be of senior standing by the Council, and surgical experience gained by assisting the surgical members of the honorary staffs of the large public hospitals at operations and in the out-patient department. It was obligatory that the course should last at least five years after graduation.

It was probable, he said, that the primary Fellowship examination of the Royal College of Surgeons of England would be held in Australia in August or September, 1931, provided that not less than 25 eligible candidates offered themselves for examination. If this experiment proved successful, it would forge a link in the chain binding Australia to England, and would bring more Australian graduates intimately under the traditions of British surgery.

Two examiners in anatomy and two examiners in physiology, who shall be present or past members of the board of examiners in anatomy and physiology for the Fellowship, will be sent by the college from England. A professor of anatomy and a professor of physiology, or such other persons as may be agreed upon, shall be appointed by the council from names submitted by the College of Surgeons of Australasia, to act as assessors for the examiners. The expected deficit on the examination shall be borne equally by the two colleges. The Royal College of Surgeons emphasises the fact that the proposed scheme will be provisional and experimental only, and that it shall be free to decline to hold another examination in Australia without laying itself open to any suggestion of a breach of faith.

The suggested scheme has been circulated to all members of the council, and the replies are unanimously in favour of its adoption. The honorary secretary has therefore sent a reply to the Royal College of Surgeons, accepting the scheme, with the proviso that, if this trial Fellowship examination in Australia proves unsatisfactory for any reason, either college is free to refuse to repeat the experiment.

[1] Bolt, R. A.: Jour. Amer. Med. Assoc., 1930, xciv., 1561.

The Surgeon's Fee.

The following rules for the conduct of Fellows have been drawn up and approved :—

1. The patient, or the person legally responsible for him, must consent in the choice made of a surgeon to perform the operation. It is to be noted that such a consent would be an essential factor in the successful suit by a surgeon for the recovery of his fee.

2. Having been selected by the patient, or the person legally responsible for him, the surgeon is personally responsible to him for the operation. He is also responsible for, and shall conduct, the post-operative treatment, except by special arrangement with the patient, or the person legally responsible for him.

3. The surgeon must render his account direct to the patient, or to the person legally responsible for him.

4. The surgeon must not accept his fee for an operation from the practitioner in charge of the patient, unless the surgeon forwards a receipt for the fee received direct to the patient, or to the person legally responsible for him.

5. If circumstances compel the surgeon to delegate the post-operative treatment of a patient to another practitioner, the latter must collect the fee for so doing direct from the patient, or from the person legally responsible for him. The surgeon must not pay the practitioner in charge of the patient a fee for conducting the post-operative treatment.

6. Separate accounts for the assistant, anæsthetist, or for other necessary services—e.g., the pathologist—must be sent to the patient, or to the person legally responsible for him, or the surgeon must state on his account form the exact amounts due for these services.

7. The assistant's standard fee shall be not more than one-eighth of the operation fee, or, alternatively, not more than five guineas. When, owing to special circumstances, the assistant's fee is larger than this amount, the assistant must render his own account on his own account form.

8. The anæsthetist's standard fee shall not be more than one-eighth of the operation fee, or, alternatively, not more than five guineas. When, owing to special circumstances, the anæsthetist's fee is larger than this amount, the anæsthetist must render his own account on his own account form.

9. It is desirable that the practitioner in charge of the patient should be present at an operation on his patient. Should he have to travel any considerable distance for this purpose, the patient must be informed beforehand of the extra fee involved.

Affairs of the College.

The President reported that there are now 353 Fellows of the college (two of them honorary) and 14 junior Members. The balance-sheet showed that the finances were in a sound state, and though the *Journal* showed a deficit of about £133, the executive expressed its congratulations on the high standard maintained. The only nominations for the council were E. D. Adhern, A. L. Kenny, Sir Henry Newland, R. Hamilton Russell, and F. P. Sandes, the retiring members, who were accordingly re-elected. It is proposed that the college shall be incorporated under The Companies Act of one of the Australian States, and Victoria has been chosen. If it is decided later to apply for a Royal Charter, there will be nothing to prevent a dissolution of the incorporation.

At the inaugural meeting Prof. F. Wood Jones gave a lecture on Physical and Biological Concepts in Science, and at the conclusion of the meeting Mr. R. Hamilton Russell was presented with his portrait, painted by Mr. G. W. Lambert, A.R.A. In thanking the President and the college, Mr. Hamilton Russell recalled the association in his student days with Lord Lister, at whose feet, he said, he laid this tribute.

The last evening of the conference was devoted to scientific papers in the several sections.

LONDON FOOT HOSPITAL.—It is proposed to purchase the new freehold building at 33, Fitzroy-square for £18,000, but at present only £7000 is available. Last year's income on general accounts was £2461, but the expenditure was nearly £900 more, chiefly by reason of bank interest. A recent annual meeting was reminded that the hospital was the only one of its kind in Europe until similar work was undertaken in the provinces.

GENERAL MEDICAL COUNCIL.

SUMMER SESSION, MAY 27TH–31ST, 1930.

PENAL CASES REPORTED BY THE DENTAL BOARD.

A FURTHER report of the Dental Board on *the Case of James Edgar Nelson* [1] was considered in camera. The President announced that the Registrar had been instructed to erase Mr. Nelson's name from the Register.

The Case of Joseph Limbrick, registered as of 8, High-street, North Woolwich, "Dentist 1921." The Dental Board recommended that Mr. Limbrick's name be erased from the Register after consideration of the following facts, established before them by evidence :—

Limbrick was on Nov. 21st, 1929, at the Central Criminal Court, convicted on indictment for that he, on Oct. 23rd, 1926, married Dora Kates during the life of his wife Emily Jane, in respect of which he was sentenced to six months' imprisonment in the second division. He had been a Welsh miner and local preacher. He was married to his present wife on Dec. 31st, 1909, at the Congregational Chapel, Talbot-street, Oldbury. There were three children of the marriage. In June, 1919, Limbrick deserted his wife, who later in the same year obtained a separation order against him.

He went to Southampton, and there in August, 1926, met Dora Kates. Representing himself to be a widower he proposed, and they went through a form of marriage at Brentford Registry Office on Oct. 23rd, 1926. They resided at various addresses until 1928, when they moved to 8, High-street, North Woolwich.

In September, 1929, Limbrick became friendly with a patient named Alice Church, and at his suggestion she came to reside at 8, High-street, North Woolwich. He misconducted himself with the said Alice Church, and on Oct. 15th, 1929, left Woolwich with her in a car which he had and returned on the 18th. Meanwhile Miss Kates, having learned that his wife was still alive, had written to Limbrick saying so. On his return he taunted her about the letter and stated that she was no better than Alice Church.

Dora Kates, when she met Limbrick, had £1000. This has all gone. Alice Church had money which was used in part payment for the motor-car. The arrears of maintenance for the legal wife of Limbrick amounted to about £550.

Limbrick stated that he was being divorced, that he wished to marry Miss Kates as soon as possible, and to go with her abroad to practise dentistry. He had already obtained a passport.

The Dental Board's solicitor, Mr. C. J. Harper, and Mr. Limbrick addressed the Council. After deliberation in camera, the President announced that the Council had directed the Registrar to erase Mr. Limbrick's name.

The Case of Frederick William Osborn, registered as of 22A, Regent-street, Rugby, "Dentist 1921." The Dental Board found that the name of Mr. Osborn ought to be erased from the Register owing to the following facts, established before them by evidence :

Osborn had been convicted on Feb. 18th, 1930, at Rugby Petty Sessions, of feloniously stealing a banker's cheque value £4, the property of Harry Seal-Wilson, and had been fined £3 19*s.* and £1 1*s.* costs. He had pleaded guilty. Osborn had been employed by Mr. Seal-Wilson, a dentist, whose principal surgery was in Bloomsbury, but who had several branches about the country. Osborn had been manager of the Rugby branch at a salary of £5 10*s.* with commission. He had opened a letter addressed to Seal-Wilson which contained a cheque, endorsed it without authority, and used it for his own purposes. There were other cases, but only the one above-mentioned had been proceeded with.

In 1927–28 Osborn had embezzled the sum of £64 belonging to Mr. Seal-Wilson by taking letters containing cheques and endorsing them in Seal-Wilson's name. The latter, at Osborn's earnest request and solemn assurance that it should never occur again, overlooked the matter. Osborn had, however, again stolen his cheques, and the prosecution followed.

Mr. Osborn did not attend, and after deliberation in camera the President announced that the Council

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[1] THE LANCET, 1929, ii., 1191.

had directed the Registrar to erase his name from the Dental Register.

PENAL CASES REFERRED FROM 1929.

The Case of Elizabeth Caroline Mudie, registered as of 3, Windsor-quadrant, Kelvinside, Glasgow, W., L.R.C.P. Edin. 1925, L.R.C.S. Edin. 1925, L.R.F.P.S. Glasg. 1925, who had been referred from the summer session, 1929.[2]

Mr. Harper said that the Medical Defence Union had received copies of the testimonials provided by Dr. Mudie and did not wish to prefer any further charge. Dr. Mudie said that she had no further connexion with the business in question and no longer derived any benefit from it. After deliberation in camera the President announced that the Council had decided not to erase Dr. Mudie's name from the Register.

The Case of William Mulhall Corbet,[3] registered as of 66, Finsbury-pavement, E.C. 2, M.B., B.Ch. 1915, N.U.Irel. who had been referred from the summer session, 1929. Mr. Corbet appeared. Mr. Harper announced that the Medical Defence Union had been furnished with a copy of the testimonials supplied by Mr. Corbet and had no further complaints to offer. The Legal Assessor read the testimonials, and Mr. Corbet gave assurances of regret and promises to refrain in future from the conduct proved against him. After deliberation in camera the President announced that the Council had not seen fit to erase Mr. Corbet's name from the Register.

NEW PENAL CASES.

The Case of Frederick Wyndham Chamberlain, registered as of Aylsham-road, Norwich, L.M.S.S.A. Lond. 1915, M.R.C.S. Eng. 1920, L.R.C.P. Lond. 1920, who had been summoned to appear before the Council on the following charge :—

"That you were at the Essex County Assizes, commencing on Feb. 10th, 1930, convicted of indecently assaulting two male persons under the age of 16 years, and were sentenced to 15 months' imprisonment in the second division."

Mr. Harper laid the facts before the Council and read the judge's summing-up at the trial. Mr. Chamberlain did not appear and was not represented. After deliberation in camera the President announced that the Council had found the charge proved to their satisfaction and had directed the Registrar to erase Mr. Chamberlain's name from the Register.

Alleged Adultery with a Patient.

The Case of Frederick William Barton (senior), registered as of 218, Stockwell-road, London, S.W. 9, M.R.C.S. Eng. 1889, L.R.C.P. Lond. 1889, L.S.A. Lond. 1889, who had been summoned to appear before the Council on the following charge :—

"That, being a registered medical practitioner, you abused your position by committing adultery with Mrs. Lizzie Catherine Thomas, a widow, with whom you stood and with whose deceased husband you had stood in professional relationship, of which adultery you were found guilty by the decree of the Probate, Divorce and Admiralty Division (Divorce) of the High Court of Justice, dated Jan. 16th, 1930, in the case of Barton *v.* Barton, in which you were the respondent. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect."

Mr. Barton did not appear and was not represented. Mr. Harper laid the facts before the Council and put in evidence the record of divorce proceedings. Mr. Barton admitted, he said, that Mr. Thomas had been a patient of his and that there had been a liaison, but said it had not occurred until some years after Mr. Thomas's death, when professional relationship had ceased. There was a declaration from Dr. Barton's son describing the relationship between respondent and Mrs. Thomas and the professional attendance of Dr. Barton on Mr. Thomas.

Mr. Harper called in evidence Mrs. Emily Allen Claydon, Mrs. Thomas's landlady, who testified to her statutory declaration, describing professional relationship between Dr. Barton and Mrs. Thomas, although she understood that Dr. Barton had made no charge.

Miss Alice Ellis, a church nurse, testified to her statutory declaration in which she said that Mrs. Thomas had told her that Dr. Barton had been their doctor for many years. She stated that he had actually attended Mrs. Thomas after her husband's death in 1925.

After deliberation in camera the President announced that the Council had adjourned the case for six months, in order that the respondent might appear.

Mr. Harper drew attention to the fact that this case concerned Frederick William Barton senior, of 218, Stockwell-road, and not the younger practitioner of the same name of 182, Stockwell-road.

A Conviction for Drunkenness.

The Case of Percy Bateman, registered as of 423, New Cross-road, London, S.E. 14, L.R.C.P. & S. Edin. 1906, L.F.P.S. Glasg. 1906, who had been summoned to appear before the Council on the following charge :—

"That you were on April 2nd, 1930, convicted at the Woolwich Police-court of the following misdemeanour—namely, of being drunk, and were fined 5*s.* or five days' imprisonment in default."

Mr. Harper explained that this single conviction followed on four similar convictions in 1927 and another in 1928. In the latter year the respondent had appeared before the Council and given an undertaking that conviction should never occur again. Six months later he had again been summoned for drunkenness, but had been admitted to a mental home in Camberwell before sentence had been passed. The story was in many ways a tragic one. Dr. Bateman had left the home too soon and his nerves had again given way. Mrs. Bateman had then secured a small house on the Becontree estate and there the doctor had obtained an appointment on the panel. The present conviction arose out of a meeting with a publican friend on the day the respondent had received a small cheque for panel fees. The doctor had remembered no more until he had gone up to a policeman and invited arrest. Next day he had been convicted, and admitted into the Nuneaton home of the C.E.T.S. on a specially reduced charge which Mrs. Bateman was now struggling to pay, week by week. Mr. Harper read two letters from the respondent, one from the superintendent of the home, and one from the police commissioner. Dr. Bateman's letters expressed no regret and admitted no drunkenness but spoke only of loss of memory and overwork; he undertook to remain in the home for 12 months. The superintendent said that the doctor was suffering from nervous breakdown, but was improving; he hoped ultimately to do medical work in more congenial surroundings. Mrs. Bateman confirmed the facts set out by Mr. Harper.

After deliberation in camera the President announced that the Council had postponed judgment on the conviction proved against Mr. Bateman for 12 months.

Removal of Name.

The Registrar reported that the three degrees held by *Mr. William Wolfe Glucksman* had been withdrawn, the L.R.F.P.S. Glasg. 1920, having been recalled in February last. The committee reported that they were satisfied that Mr. Glucksman had not been deprived of his qualifications on the ground of the adoption of any theory of medicine or surgery, and the Council directed the Registrar to remove Mr. Glucksman's name from the Register under Standing Orders, Chap. 13, ii., 7.

Alleged Canvassing and Alienation of Patients: the Case Dismissed.

The Case of Arnold Fletcher Doyle, registered as of Highbury, Old Hill, Staffs., M.R.C.S. Eng. 1923,

[2] THE LANCET, 1929, i., 1213.
[3] THE LANCET, 1929, i., 1216.

L.R.C.P. Lond. 1923, M.B., B.S. 1924, U. Lond., who had been summoned to appear before the Council on the following charge :—

"That, being a registered medical practitioner, and while engaged as assistant in his practice to Thomas Ellis Mitchell, M.B., and subsequently, you endeavoured to attract to yourself the patients of the said Thomas Ellis Mitchell, and in one instance of Dr. A. McQueen, by various improper means and in particular: (1) By canvassing such patients either directly yourself or by means of an agent. Patients so canvassed were Mrs. Daisy Homer, Mrs. Florence Plant, Samuel Jackson (a patient of Dr. A. McQueen), Mrs. Emmie Willetts, Mrs. Clara Tommey, Mrs. Kate Maguire, and Miss Lucy Coley. (2) By substituting without authority your name for that of the said Thomas Ellis Mitchell on the medical cards of certain patients of his—namely, Norman Leslie Clark, Horace Priest, and Mrs. Lily Sidaway. (3) By asking the secretaries—viz., Dan Adams Priest and Benjamin Troman, of the Women's Clubs of the said Thomas Ellis Mitchell for lists of members and for their help in getting you the members as patients. (4) By depreciating to patients of the said Thomas Ellis Mitchell the capabilities of himself and of his dispenser, Miss Mary Constance Wilkinson. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect."

The complainant was Dr. T. E. Mitchell. Dr. Mitchell was represented by Mr. T. C. Carthew, counsel, instructed by Messrs. Taylor, Jelf and Co. Dr. Doyle was represented by Mr. Ward, instructed by Messrs. Jeffrey, Wild and Lovatt.

Mr. Carthew, opening the case for the complainant, said that in September, 1928, Dr. Mitchell had advertised for an assistant in the *British Medical Journal* and Dr. Doyle had been appointed, but no agreement had ever been signed. An agreement in the usual form had been put forward by complainant in April, 1929, but respondent had then refused to sign it. Respondent had taken over the panel patients of his predecessor, acting as deputy for him until the end of 1928, and at the beginning of 1929 the patients had been transferred. In August, 1929, complainant had found respondent "storming at" the dispenser, and said that complaints should be brought to him in the first place. Respondent had said he had been very dissatisfied with the dispensing and had set traps for her; he had added that for "two pins he would twist her blinking neck." Thereafter he had made up his own prescriptions. Soon after respondent had demanded that Dr. Mitchell should sell him a share of the practice. Dr. Mitchell had refused, having a son qualifying at Guy's. He had then taken proceedings in the County Court to terminate the assistantship, as respondent refused to accept the sum offered in lieu of notice. The new assistant had found that in several panel cards Dr. Mitchell's name had been scratched out with pen or knife, and that Dr. Doyle had signed his name in its place. Respondent claimed that this was done with complainant's knowledge because his panel was full; complainant denied this. In September or October Dr. Doyle had started a women's club in the same town and had approached secretaries attempting to secure members from other clubs. Patients would testify to respondent's canvassing. There was evidence that respondent had gone into a patient's house the day after complainant had called and prescribed, and had advised the mother to throw the medicine down the sink.

Dr. Mitchell testified to his statutory declaration, and in reply to cross-examination confirmed the facts as set forth by his counsel. There had been no discussion whatever of possible partnership at the first interview with respondent. He could not say how many panel patients had been allocated to Dr. Doyle by the Allocation Committee on Jan. 1st, 1929. It might have been over 1500, but he did not admit that that proved that the committee regarded Dr. Doyle as a partner or prospective partner. His own panel list had never been full or complete and he was prepared to prove it: the figure of 2503 was the "reputed" and not the "actual" figure.

In reply to the Legal Assessor, he said that when cards were brought to his surgery with the name of a doctor on them he had never given any authority to Dr. Doyle to erase the name, and he had never seen it done, nor known of its being done. Two of the cases had been discovered before Dr. Doyle left, but he had not personally taxed Dr. Doyle with them. When cards were brought in with no name on them complainant usually signed them, but in his absence cards were usually handed to the panel clerk for subsequent discussion between the two doctors. All panel cards had—or should have—passed through complainant's hands. If numbers were exceeded the onus was on the panel committee to give notice to reduce; he had never received such notice.

Three panel cards were put in evidence, two showing erasures, and complainant declared that he had never given authority for the erasures.

In answer to Dr. H. B. Brackenbury, through the chair, complainant said that Dr. Doyle had signed cards in his own name, not "pro Dr. Mitchell." He did not know at all whether Dr. Doyle's name had appeared on the county medical list as an assistant or a separate practitioner.

Horace Priest and Mrs. Lily Sidaway testified to their statutory declarations and insurance cards, on which Dr. Doyle's name had been substituted for Dr. Mitchell's.

Mr. Dan Adams Priest and Mr. Benjamin Troman, secretaries of women's clubs, testified to their statutory declarations, and stated that Dr. Doyle had asked them for lists of club members. Mr. Troman said that respondent had said he had already 200 members out of that club and had added "You'll see what you can do," presumably implying a desire to be appointed doctor of the club.

Miss Daisy Homer appeared as a witness on behalf of her mother, who was ill. She had been present throughout the whole interview between her mother and Dr. Doyle. Dr. Doyle had called and said he and Dr. Mitchell had split partnership and he had started a club on his own which her mother might join; she might also tell other people in the house and other panel patients.

Mrs. Florence Plant and Mr. Samuel Jackson testified to their statutory declarations. Mrs. Plant said she had got the impression from Dr. Doyle that Dr. Mitchell was retiring and had called at the latter's house to ask if it were true. Mr. Jackson said that Dr. Doyle had told him to get transferred to his panel list and he could cure him. He had paid for three bottles of medicine from Dr. Doyle but had been Dr. McQueen's panel patient all the time.

Mr. Norman Leslie Clark and Mrs. Sarah Ann Hill testified to their declarations, Mrs. Hill stating that Dr. Doyle had asked her if she had any medicine from Dr. Mitchell for her son; she had never at any time complained about the medicine. Dr. Doyle had told her it was no good and told her to throw it down the sink and she had done so.

Mrs. Kate Maguire recounted an argument in her presence between the two doctors as to whose panel patient she was. She had never at any time been on Dr. Doyle's panel. Dr. Doyle had said "Take no notice of him; the old man's going off his head." He had not said "going off the deep end."

Miss Mary Constance Wilkinson, the dispenser, confirmed the material facts. She had heard Dr. Doyle say to a patient (Frederick Rock) that Dr. Mitchell would soon have him stiff and cold. She had dispensed for Dr. Mitchell about three years before Dr. Doyle arrived, and neither Dr. Mitchell nor his former assistant had ever made any complaints.

In reply to the President, she said that Dr. Doyle's complaint had been that she had omitted some magnesium sulphate from a bottle of medicine; no steps had been taken to test for magnesium sulphate. She maintained that this drug had never been put on the prescription.

In reply to the Legal Assessor, she identified Horace Priest's panel card and denied absolutely having made the erasure and substituting Dr. Doyle's

name. She had not seen the card before the erasure had been made.

Mrs. Mary Evans testified to her statutory declaration describing canvassing by Dr. Doyle.

Dr. T. F. Tibbetts, chairman of the Dudley Panel Committee, testified that a panel doctor, at the relevant period, was allowed 4000 patients, 2500 for the principal and 1500 for the assistant. It was not true that the number for an assistant was limited to 1000.

In answer to the President, he said that the numbers were estimated by the amount paid quarterly; it was not an absolute number of names. In answer to Sir Robert Bolam, through the chair, he thought that a panel of 3000 would probably mean a number of credits of about 2800. In answer to Dr. H. B. Brackenbury, through the chair, he agreed that it was the practice in Staffordshire to allow the principal to increase his panel from 2500 to 4000 if he took an assistant, and there was no ruling as to how many belonged to each.

Dr. Doyle, examined by Mr. Ward, declared that he had taken the assistantship with a view to partnership and had signed forms for the insurance committee, with Dr. Mitchell's knowledge, stating that he was in partnership. At that time Dr. Mitchell had said that this was stretching the regulations slightly, but that, as Dr. Doyle was going to buy a share, it did not matter. The allocations had been made to respondent personally and his name had appeared as a separate doctor on the medical list. On Norman Clarke's card Dr. Mitchell's name had been crossed out by him as part of the routine of the practice; he had signed some hundred cards, some blank and some with Dr. Mitchell's name on them. No complaint or comment had ever been made and Dr. Mitchell had had all the fees. He emphatically denied ever erasing anything from Horace Priest's card and was certain that the handwriting of the name of "Dr. Doyle" was not his writing, though the signature "A. F. Doyle" was. He had asked the secretaries of the clubs to put his name up as one of the doctors who might be chosen by the members as their doctor; he did not consider that he was doing anything wrong. He had been treating members of the clubs ever since he had been there. A list of members would not have been the slightest use to him and he had never asked for it. He had said to Mr. Troman that if he did not get on the club he would be forced to form a club of his own. He had no need to ask for help in getting patients; he had 2000 on his list at the present time. About 800 of the original 1500 panel patients had transferred back to Dr. Mitchell and 500 or 600 new patients had joined him from other doctors. He denied the canvassing charges. He maintained that the district was seriously under-doctored, and that Mrs. Hill had complained to him that the medicine was not doing the boy any good. He had never told her to put it down the sink, but he had known the medicines were not being dispensed correctly and had told her to send for something else. He had not blamed Dr. Mitchell for it and had not told Dr. Mitchell that he had changed the medicine. On many occasions he had watched Miss Wilkinson dispense and noticed her putting in less than he had ordered. No prescriptions were ever kept. He had never discussed Dr. Mitchell with Mr. Rock or any other patient. He had always had regard to the etiquette of his profession in all his dealings.

Cross-examined by Mr. Carthew, respondent said that he had been a stranger to the district before he went as Dr. Mitchell's assistant. He asserted that every one of the doctors in the neighbourhood was against him. He knew that Dr. Mitchell had a son a medical student, not that he had always had a salaried assistant. If he had complained to Dr. Mitchell about the dispenser she might have got into more trouble; he was not in the habit of going behind people's backs.

The Legal Assessor asked if respondent thought she was misdispensing from incompetence or wilfulness, as he had said he thought she might improve if he spoke to her direct. Dr. Doyle replied that he did not wish to make any suggestion. Mr. Carthew quoted respondent's evidence "I do not know whether she did it carelessly or from some other reason" and asked what reason. Dr. Doyle suggested laziness, as the magnesium sulphate was in a heavy bottle on a high shelf. Pressed by Mr. Carthew, he said he did not wish to give any other explanation. Complainant had promised him an appointment, but had put off the preparation of the agreement from day to day until he had sprung the bombshell of instant dismissal, leaving him with a panel of 1600 on his hands and nowhere to go. He had no recollection of Horace Priest among his many patients, but could only suggest as likely to erase a name those people who handled the cards—viz., the patient, his mother, the dispenser, or Dr. Mitchell himself. He took it for granted that he had authority to cross out Dr. Mitchell's name and substitute his own.

Mr. Carthew established that the usual arrangement in the district was for each club to have one doctor, appointed by a two-thirds majority of the members, and the club was known as "Dr. So-and-So's club." Two doctors were only found in combination on a club if they were in partnership. Dr. Doyle explained his request to be appointed medical officer to Dr. Mitchell's clubs as due to his ignorance of their rules and customs at that time; he would not so apply now, but did not admit that such an action was an improper one and an attempt to filch away patients. He would have no objection to any other doctor applying to his club, because he knew the application would have no chance. He had prescribed for and charged Jackson, knowing that he was Dr. McQueen's patient; he had disliked doing it but Jackson had urged it. Dr. Mitchell knew about it and took the money; respondent assumed that Dr. Mitchell knew Samuel Jackson was Dr. McQueen's patient. He had said "Here's two shillings for a bottle of medicine from Samuel Jackson"; he flatly denied that Dr. Mitchell was ignorant of the whole transaction.

In answer to the Legal Assessor, respondent agreed that the letter written by Dr. Mitchell to him after the interview contained no reference whatever to any idea of partnership. He would never have considered going but for the verbal promise of a partnership and had accepted the position on that letter because he relied on Dr. Mitchell's word. He had signed Priest's card with the erasure on it, but had not mentioned the erasure to anybody. He did not remember whether he had had other cards with erasures on them.

In reply to members through the chair, Dr. Doyle said that all the patients of whom he had spoken to the club secretaries had come to him in the five or six weeks after he had broken with Dr. Mitchell. He had worked on the panel for about three years and when he had written to the clerk of the insurance committee he had believed that the clerk could give the patients a chance to return to Dr. Mitchell. The clerk had called about three days later and explained, and suggested that a card of change of address be sent to all patients on Dr. Doyle's list. No other information had been given, and there had been nothing in the notice to suggest any breach with Dr. Mitchell. Dr. Mitchell ran an insurance practice of 4000 with the assistance, successively, of Dr. Roberts, Dr. Clark, and Dr. Doyle, and each of these gentlemen obtained their patients from Dr. Mitchell's practice. Dr. Doyle declared that Dr. Clark had personally transferred the practice to him, but for no consideration. He knew that there was a definition of a partner in the National Health Insurance Act; he had never been allowed to bring himself within that definition. He had offered to pay Dr. Mitchell for his share of the panel. He considered that if he had left the district he could have transferred his panel to someone else for a consideration.

Dr. Eason, through the chair, asked who had made the statement to the Staffordshire official that

Dr. Doyle was a partner. Mr. Ward replied that the documents had been asked for and refused by the Insurance Committee.

Re-examined by Mr. Ward, Dr. Doyle said that the contract with the National Health Insurance made him stay in the district or provide a deputy for three months after giving notice. He had had a letter from Dr. Mitchell on Oct. 4th, 1928, saying that as the joint panel slightly exceeded the number allowed for one practitioner and an assistant, Dr. Doyle would have to act as a salaried partner, on which an agreement would have to be signed. In April Dr. Mitchell had put forward a form of agreement offering the status of partner but with a clause saying that there should be no claim on the goodwill of the practice. This Dr. Doyle had refused to sign. After the split Dr. Doyle had taken his solicitor to see the clerk of the Insurance Committee to see what should be done, and he had followed the clerk's instructions precisely.

Mr. Alfred Lovatt, Dr. Doyle's solicitor, testified to being present at the interview between his client and the clerk to the Insurance Committee.

Mrs. Florence Doyle confirmed Dr. Doyle's account of the interview with Dr. Mitchell, stating that Dr. Mitchell had promised a two-fifths share in 12 months. This was their first interview.

Cross-examined, she could not remember Dr. Mitchell's words, but he had said that he had been considering taking a partner and that he would offer a partnership. The 12 months might have been to give Dr. Mitchell time to consider whether he liked Dr. Doyle or not. The offer had not been made until after an hour and a half's conversation, and Dr. Doyle had repeatedly said that he would not go to Old Hill without the promise of a partnership.

Sir Robert Bolam asked through the chair if the price of the partnership had been discussed. Mrs. Doyle replied that she did not think so, but that she had not been present the whole time.

Arthur Harvey Cole, a hairdresser and a patient of Dr. Doyle's, confirmed Dr. Doyle's account of the complaint about his third bottle of medicine. Cross-examined, he said he did not know whether the mistake was in the prescribing or in the dispensing. Dr. Bone pointed out that witness had said he had put the medicine down the sink, whereas his statutory declaration said that Dr. Doyle had taken it back to the surgery. Witness said the declaration was right.

Mrs. Ellen Davis testified to complaining of the medicine to Dr. Doyle. Cross-examined, she said she had no idea what was wrong, but one bottle had smelt after a day or two; the first few doses had been all right. In reply to the President, there had been nothing wrong when she had received it.

Frederick Rock testified to his statutory declaration, saying that his wife had obtained relief from some bottles of medicine and not from others. He had never discussed Dr. Mitchell with Dr. Doyle.

Mr. Ward and Mr. Carthew then addressed the Council. After deliberation in camera the President announced that the facts alleged against Dr. Doyle had not been proved to the satisfaction of the Council.

The Case of Hans-Raj, registered as of 40, Clifton-street, Bilston, Staffs., M.R.C.S. Eng. 1925, L.R.C.P. Lond. 1925, who had been summoned to appear before the Council on the following charge:—

"That, being a registered medical practitioner, you have canvassed patients of Fakir Chand, M.B., for whom you formerly acted as assistant, with a view to their transferring from his panel to yours, and in particular the following patients—viz.: (1) In or about the month of February, 1929, Florrie May Watts. (2) In or about the month of March or April, 1929, Arthur Jeavons. (3) In or about the month of May, 1929, Joseph Caddick. (4) In or about the month of May, 1929, William Lewis. (5) In or about the month of June, 1929, Thomas Blewitt. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect."

The complainant was Mr. Fakir Chand, M.B.; Mr. Hans-Raj was represented by Mr. Freibusch, solicitor. Mr. Chand conducted his own case. He related his medical history and his association with the respondent, and put in five statutory declarations from patients supporting the charge of canvassing. He was unable to produce witnesses. After cross-examining complainant, Mr. Freibusch submitted that he had no case to answer. After deliberation in camera the President announced that the Council agreed with this submission, and the case was therefore dismissed.

Alleged Seduction of a Patient: the Case Dismissed.

The Case of Abraham Hipwell, registered as of 1, Homefield-place, Heavitree, Exeter, L., L.M. 1906, R.C.P. & S. Irel., D.P.H. Liverp. 1909, who had been summoned to appear before the Council on the following charge:—

"That you abused your position as a medical man by seducing a patient—namely, Mrs. Hilda Annie Spike—whom you were attending professionally, and also by behaving or attempting to behave improperly to her on divers occasions subsequently while she was still your patient. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect."

The complainant was Mrs. H. A. Spike, who was represented by Mr. F. S. Laskey, counsel, instructed by Mr. J. C. M. Dyke.

Dr. Hipwell attended in answer to his summons, and was represented by Mr. H. A. Singleton, K.C., and Mr. T. C. Carthew, counsel, instructed by Messrs. Le Brasseur and Oakley.

Mr. Laskey said that Mrs. Spike was a widow whose husband had been killed in 1917; she had two sons, aged 15 and 17 respectively. Respondent had been her regular medical attendant. Until 1927 she had enjoyed good health, but in that year she had had a vulval cyst which had been removed in August in a nursing home. She had to return for further operative procedures in September. Respondent had attended her after she had left the home once before Oct. 27th, but had not examined her. About a week before that date she had asked for an examination to be sure everything was all right. On that day he had called and seen her in bed. A servant was present in the house, but Mrs. Spike had not been anxious to have her in the room, and neither party pressed the suggestion. The doctor had held her on the bed with his left hand and had connexion with her. She had made no effective resistance, but she maintained that at this time her will had been entirely dominated by that of the doctor. It had all happened very quickly. In consequence she had become pregnant, of which fact she had become certain in January, 1928. Respondent had then four times supplied her with medicines; she had kept the three last bottles, which were in evidence. Of these the first had contained Epsom salts, the second contained ergot, and the third was innocent, containing a mild tonic and Epsom salts. At the end of January she had again assured the doctor that she was pregnant; the doctor had performed some operation from which she had suffered intense pain, and there had been an abortion. Since then her health had been seriously affected, and she had attended several doctors, including respondent. Her explanation was that her illness was due to the doctor's actions, and he ought to cure her. In March, 1928, she had asked definitely if she could be cured, and told him he ought to help her; he suggested paying a sum of money towards her expenses, and in April or May a solicitor acting on the doctor's behalf had called on her, offered her a loan—which was refused—and finally handed her £30 unconditionally. In March a series of X ray photographs had been taken after a bismuth meal. The photographs handed to Mrs. Spike by Dr. Hipwell were not complete; she had seen the negative of the one missing one, which showed the uterus. Subsequently, when she had asked for this picture, respondent had said that he did not possess it. The photographs had been handed to complainant's medical adviser. Her brother, in August, 1929, had interviewed respondent with her; he had said, "This

will be a very serious thing for me." In December complainant's adviser had written to respondent threatening proceedings; his advisers had repudiated liability and suggested that complainant's motive was blackmail. Her advisers had then stated that she only wished to be cured, by respondent if necessary, but at all events to have her expenses paid.

The complainant, examined by Mr. Laskey, testified to her statutory declaration. She had known Dr. Hipwell since 1920 or 1921. On Oct. 27th, 1927, respondent had examined her internally, and said that the womb was a little lower than it should be. He had told her to get out of bed, and she had obeyed. He had put his hand under her nightdress, an action which at the time she had thought was for examination. He had directed her to lie on her back on the bed; then assaulted her. After the assault he had said, "I am sorry, it is all my fault." He had instructed her to use a syringe. She had not screamed, as she had been under his power. Respondent had leant over her, fixed his eyes on hers, and she had felt she had no power to resist. He had then left the house. Subsequently, in December, respondent had treated her for a boil. She confirmed counsel's account of her pregnancy and the consultation in January. Respondent had given her the medicine referred to in counsel's opening, and subsequently had examined her at his surgery and performed the operation which had led to the abortion. In showing her the skiagram now alleged to be missing, respondent had said that it was a photograph of the stomach, but witness thought it represented the uterus. She had taken respondent the bill for the photographs, and he had paid her the amount in notes. In January she had gone to another medical attendant who had dropped her case after a short time, and she had returned to respondent. In March she had threatened to claim damages, and he had offered £20. She had asked that compensation be paid through a solicitor, and £30 had been paid. She had given no receipt. On another occasion, in the summer of 1928, respondent had asked her to lie on the sofa in his surgery, and she had refused. On other occasions when he had been examining her he had undone his clothing, and she had told him to behave himself. Her illness in 1928 and 1929 had consisted chiefly of repeated vomiting and pain in the left side. Respondent had never sent an account for his services.

Cross-examined by Mr. Singleton, witness admitted having written a letter to respondent on May 10th, 1928, asking for a loan and for a consultation. She admitted having asked for more money from respondent's adviser in April, 1929. In December, 1929, after the visit with her brother, she had visited respondent's surgery again with her son and had asked to see his wife; he had telephoned or pretended to telephone to the police.

The doctor had put his arm round her waist, before October, 1927, just once; he had not had the chance to do it again. She had not complained to respondent that the surgeon had ruined her or disfigured her. She considered that respondent had exercised hypnotic influence; she presumed that the seduction was due partly to that and partly to her weak state after the operation. She had not visited the surgery on Oct. 27th. The medicines were all in the bottles she had received them in; the doctor had given her prescriptions which she had taken to a chemist. The medicine in the bottles was the original medicine. He had said, "Take this for my sake." She had kept the bottles for over two years, but had never taken any. She had not kept them for any special reason, and had not changed the contents of the bottles. She had not kept any more. She had visited the surgery on Jan. 27th, when he had performed some operation; he had then told her to go away at once as she would be very ill. She did not visit the surgery next day. She admitted that in January, before the 27th, she had been having slight three-weekly periods. She had asked respondent if at that time it was possible to have periods when pregnant, and he had said it was not. Respondent had suggested the X ray examination "to clear himself"; she had threatened in March to take her life if she suffered much more pain. She denied having ever been treated for her nervous temperament—which she admitted. She denied that she had continually asked respondent for money to go away for a rest, according to a second doctor's advice. She alleged that a short time before her letter asking for money respondent had offered her £25 in his surgery; she had refused, but her expenses had increased and so she had written the letter. She could not give any details of this expense. The money paid by the solicitor had not in any way been given as hush-money. She had continued attending respondent regularly until September, 1929. She had gone to his solicitor again in April, 1929, to discuss her expenses. In spite of her solicitor's letter threatening proceedings unless respondent suggested some form of compensation, she denied that her object was money "in the way Dr. Hipwell put it."

Re-examined, she said that she had been ordered two abdominal belts, one in 1928 and one in 1929; she had gone to see respondent's solicitors just after receiving the second account, in response to their invitation to inform them if she incurred any further expense. Witness stated that respondent had himself handed the medicines to her, and that she had not obtained them from a chemist.

Mr. Frank Edward Street, brother of the complainant, examined, stated that her health had been good until the end of 1927. In the early part of the summer of 1929 he had interviewed respondent with his sister. Cross-examined, he admitted that he had said twice that he had not come for blackmail, but had said at the end of the interview that he was very dissatisfied and would put the matter in other hands. He had gone to respondent to hear his account of the matter. He said that, from his sister's account, he thought that respondent could only have been attempting to procure abortion, but admitted that he had not said this in his statutory declaration. Respondent had denied performing an operation, and had shown an object which he had said was a torch, which he said he had used. In reply to a question through the Chair, witness said that he had not known that his sister was at all in want of money.

Mr. Singleton addressed the Council before calling witnesses for the respondent. He said that, but for the payment of the £30, the case would obviously be unproved. Respondent's solicitor had made the payment on his own initiative. If he had made no payment, the charge would never have been brought. Moreover, respondent had acted unwisely in continuing to attend the complainant. The medicine containing ergot had been prescribed for frequent periods, and counsel proposed to show that the bottle produced was not that in which it had been dispensed.

Dr. Hipwell, giving evidence on his own behalf, stated that complainant's record showed attendance since 1922. She had complained that she had been "ruined" by the second operation at the nursing home, and he had examined her on that occasion, about Oct. 10th, in his consulting-room. He had not visited her on the date of the alleged assault; she had visited him, and he had prescribed bromide and arsenic for nervousness. He had never had intercourse with her at any time, nor had he put his arm round her waist. The labels on the bottles were all in his writing. The ergot prescription had been one for a chemist, as he had stocked no ergot. All the labels on bottles dispensed by him were numbered in series, corresponding to the date; all the three bottles produced were dated June, although they contained medicines prescribed in January. The object of the ergot mixture had been to check flooding. On Jan. 23rd, 1928, complainant had been suffering from metrorrhagia and fortnightly periods, according to a note made at the time. She had not been pregnant and had not suggested she was pregnant until March just after he had made an internal examination

He had not examined her in January, and had never operated for any purpose at all. Her first suggestion against him had been on March 8th or 10th; she had then said that he must have used some instrument, "because he had hurt." She had also accused him at that time of causing her pregnancy. She had then been rather hysterical and suffering from a certain amount of pain; witness had suggested a second opinion or an X ray. No photograph was missing; he had paid for the films. No photograph had ever been taken of the uterus. The second opinion had prescribed a rest and change. Complainant had then said she was worried about money matters, but witness had never offered her £25. He had visited his solicitor, Mr. F. P. Cottey, after receiving complainant's letter, and Mr. Cottey had paid her money with witness's knowledge in May, 1928. Respondent had continued attending her as a patient until September, 1929. She had asked him for more money in May, 1929. She had collected and paid him a small sum from some sickness club, but had paid him no other fees. At the interview with the brother the only suggestion had been that of hurting complainant; seduction had not been mentioned. Witness had pointed out that he could have performed no operation; no preparation had been made, and no instrument used, and the couch was an unsuitable one, covered with chintz. He had shown an electric torch that he had used. On Dec. 2nd, 1929, Mrs. Spike and her son had visited him. She had first said that she wanted witness to cure her, and he had refused. She had then refused to go without seeing his wife, and he had telephoned to the police. She had then gone away, but had come to his door on Dec. 7th and handed him an empty envelope, with the address of the General Medical Council written on the back. Witness had occasionally helped patients by advancing them money. He had allowed complainant to have £30 because her financial worry had been making her condition worse. He had helped her in every way throughout.

Cross-examined, witness admitted that he was not a rich man, and that complainant had not asked for money or assistance before 1928. He had not regarded her demands at first as directed to obtaining money, but had thought she wanted to be cured. She had blamed him for her illness earlier, and he had walked out of her house and refused to treat her; she had retracted her accusation after going into a nursing home and being treated by Dr. Roper. She had not made the accusation to him personally in May, whatever she had said to Mr. Cottey. Asked why he had put the matter into Mr. Cottey's hands, he said he had wanted her to get mentally better, but that if he had handed her money he would have admitted himself liable for some injury. He had chosen the solicitor as a means of helping her to get better; she had not then been making accusations, but had threatened to do herself an injury. He had never helped other patients through a solicitor, but they had not been hysterical or invalid. He had often advised her to go to another doctor. He had no record nor recollection of seeing her in her room at any time. He had never shown her any X ray negatives. He had never told Mr. Cottey to tell complainant to come back if she had any further expenses. At the interview he had told complainant that her statements were a figment of the imagination. He had not taxed her with lying, although she had demanded money more than a year before, and he had paid it; he had tried to prove that the injury was an imaginary one. He had not sent in an account after the end of 1927, because he had been giving her money to carry on.

Re-examined, he said he had never made up an ergot medicine. To a question through the chair, he said that the accusations had preceded the payment of money, having been made in March.

Mrs. Winifred Kate Hipwell, wife of respondent, said that her relations with her husband had always been happy and normal in every way. Complainant had accosted her in the street and accused respondent of "nearly killing" her.

Mr. F. P. Cottey stated that he knew of other cases in which respondent had advanced money to patients. On May 11th, 1928, respondent had seen him in his office and produced the letter from complainant asking for a loan, and described the charges she had made against him. In the afternoon witness had seen the records of the case. The payment had been left absolutely to him. When he had left the surgery he had not decided whether or how much to pay her. He had drawn £30 from his office and, after seeing Mrs. Spike, had paid her, and had informed respondent by telephone. No sum had been discussed between him and respondent, but only certain expenses complainant would probably incur. At his interview with her she had said she would need money for her rest, and did not like to touch her sons' money or some she had had from her father. He had not asked for a note of acknowledgment, and had prepared no document of any kind. He had acted for respondent on his own advice. Complainant had not made any accusation on that occasion. Witness took entire responsibility for the payment. He had known that a suggestion of accusation had been made in March, but should never have paid any money if a charge had been made at the interview. He would never pay money for the withdrawal of a charge. In April, 1929, complainant had come to his office to ask for more money. He had met her a second time that day, coming out of his office with some third party. On a later occasion he had visited complainant's solicitors at their request, and they had suggested a sum of £300 or £400 as compensation. He had immediately advised respondent to consult Messrs. Le Brasseur and Oakley. Mr. Street, in visiting him, had complained of "injury" to his sister, and had not mentioned damages; he had advised him to see respondent personally. Later in the year complainant's solicitors had informed him that they had dropped the case, and that another firm had been instructed and had sent for the medicine. Cross-examined, he assured counsel that he would not have touched this matter if he had had the slightest suspicion that anything was wrong. With the exception of one reference by complainant to an illegal operation, no charge had ever been made. The surgery was only about 10 ft. by 10 ft.; every sound made in it could be heard outside, and anyone was liable to come in at any moment. He had thought that he was merely dealing with a genuine application for a loan.

The Council, after deliberation in camera, decided that they did not desire to hear any further evidence in defence. Mr. Laskey thereupon addressed the Council. After further deliberation in camera, the President announced that the Council had not found the facts proved to their satisfaction.

Adultery Proved in the High Court.

The Case of Andrew Alexander Fyffe, registered as of Martham, Great Yarmouth, M.R.C.S. Eng. 1912, L.R.C.P. Lond. 1912, who had been summoned to appear before the Council on the following charge:—

"That you abused your position as a medical man by committing adultery with Doris Esperanza Rosemary Chicheley Ferrier, a married woman, with whom you stood in professional relationship, of which adultery you were found guilty by the decree of the Probate, Divorce and Admiralty Division (Divorce) of the High Court of Justice, dated Dec. 3rd, 1929, in the case of Ferrier *v.* Ferrier, Thorp and Fyffe in which you were co-respondent. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect."

There was no complainant in this case.

Mr. Harper, solicitor to the Council, outlined the facts as stated in the charge. He put in the transcript of the shorthand note taken at the trial, the evidence in which had occupied eight days. This showed that a special jury had found after five minutes' deliberation that adultery had been committed; also that respondent had been in professional relationship with Mrs. Ferrier. He read extracts from the summing-

up. He summarised an account rendered by respondent to Mrs. Ferrier for professional services.

Mr. Felix Denny, counsel, instructed by Messrs. Smith and Hudson, appeared for Mr. Fyffe, who attended. Counsel applied to the President to be allowed to go behind the judgment of the High Court and disprove the adultery. The President ruled that the facts as found proved by a competent court must stand established; the Council was not competent, nor had it time to retry the issue. Mr. Denny said that respondent categorically denied adultery. Respondent had charged nothing for professional services until Mr. Ferrier had started, behind his back, inquiries about his relationship with Mrs. Ferrier; respondent had then, in "righteous indignation," submitted an account, on which he could not possibly have recovered at law. Respondent, in evidence, denied adultery. In reply to cross-examination, he said that he had independent evidence that, on the only occasion on which adultery was proved by an eye-witness, Mrs. Ferrier had been suffering from metrorrhagia. He admitted his account of his professional relationship, given at the trial.

The Council, after deliberation in camera, directed the Registrar to erase the name of Mr. Fyffe from the Register.

Colonial and Foreign Students' Committee: American Medical Students.

The members of this committee are as follows: Sir Donald MacAlister, President (Chairman), Sir Robert Bolam, Mr. Eason, Dr. Fawcett, Mr. Jamieson, Mr. Monsarrat, Sir Humphry Rolleston, Dr. Stopford, Sir Holburt Waring, Mr. Miles, Dr. Lorrain Smith, Sir Norman Walker, Dr. Coffey, Dr. Dixon.

The following report was made to the Council on the applications of American students to study medicine in Great Britain and Ireland:—

American students seeking medical education in this country fall into four classes: (1) Those who propose to take the whole of their instruction in this country and who must therefore go through exactly the same curriculum as our own students. No difficulty arises in such cases; each body is responsible for its own regulations. (2) The second class is the result of the different arrangement of the medical curriculum in America under which all students have to attend for two (in some three or four) years at a college of literal arts where along with other subjects (English, a foreign language, psychology, &c.) he studies biology, chemistry, and physics. At this stage some students seek admission to our schools and the question of recognition of these courses of study (and examination) arises. (3) A third class consists of students who have been admitted to an approved medical college, have studied one or two years, and having left these colleges for various reasons now desire to complete their course of study and to qualify in this country. (4) A fourth class consists of those students who have passed the earlier examinations for the Diploma of the National Board of Medical Examiners of the United States of America. This Board has a special reciprocal arrangement with the Conjoint Boards of England, Scotland, and Ireland under which mutual recognition is accorded to their corresponding examinations.

The difficulties which are confronting our deans and registrars are for practical purposes in connexion with classes (2) and (3). It is, of course, competent for the governing body of any school of medicine to admit any student it pleases, but it is understood that the number of applications and the difficulty of evaluating the evidence of curriculum and examinations which the students present make it desirable that there should be some clearly understood common plan of action. Fortunately, there are in the United States voluntary associations, such as the Council of Medical Education and Hospitals of the American Medical Association, the Association of American Medical Colleges, the National Board of Medical Examiners of the U.S.A., and the Federation of State Boards, all of which have established themselves in the confidence of their own people and who are willing to coöperate with us in securing a general scheme which may be acceptable to us both. A sentence in a letter dated May 12th, 1930, from Dr. Ray Lyman Wilbur to Dr. Gray, of the American University Union, tersely sums up the American viewpoint: "I am very much in favour of a certain percentage of our American students studying abroad, but I think they should be from our better students and should not belong to the inferior group." That may be taken as equally the view of those who have considered the matter on this side.

The Committee ask for a further remit to consider and to make to the Council at the November session detailed suggestions for coöperation with one or more agreed body in the United States.

May 29th, 1930. DONALD MACALISTER, Chairman.

Abstract of a Memorandum to the Committee by the Registrar.

It is common knowledge that the General Medical Council, in common with universities and medical schools in this country, have recently received hundreds of applications from students from America to be allowed to take out their course of study and to qualify in this country. It has been difficult in the absence of authentic information to assess the value of the certificates of general education which have been forwarded and also of the evidence of having passed an examination equivalent to a pre-registration examination in elementary chemistry and elementary physics. Some students who have taken out part of their curriculum at reputable institutions in America have after a certain time received "honourable dismissal," and it is not easy to ascertain exactly what this implies. The matter is further complicated by the fact that there is an arrangement between the Conjoint Boards in this country and the National Board of Medical Examiners in America, whereby those who have passed the examination of the one may be admitted without question to examination by the other. If students who for one reason or another are not considered acceptable in America can come to this country and obtain a qualification, which it is understood carries considerable weight in America, and then go back and demand to be allowed to sit for an examination which, if passed, entitles them to practise in about three-quarters of the United States, difficulties will be sure to arise. In the early part of this year the Council adopted a form of letter which was sent to American applicants, with the result that as a rule little more was heard of most of them. The letter was as follows:—

"In reply to your letter of the.....I have to say that no application from an American student can be considered unless the certificate or transcript of record is endorsed by or accompanied by a statement from the Dean of the Faculty of Medicine of a university which is a member of the Association of American Universities to the effect that the holder would be admitted to the Faculty."

A letter, dated March 13th, 1930, was received from the chairman of the Committee on Recommendations to Medical and Dental Schools of New York University in which that official said that it was the duty of his committee to investigate the claims of each intending student at his university, and quoting a letter of the General Medical Council to American applicants in England which had been received by a student of New York University. The chairman of the New York University Committee went on to say that while some of the students making application for admission to European, and especially British, schools, were not good material, others really wished to study in another country to enjoy the benefits of education abroad. In the interests of this group he points out that the endorsement required by the General Medical Council from deans of the several American medical schools cannot be obtained.

To this letter an official reply was sent, stating that it has not been easy for the Council to decide whether

the numerous applications for admission received from the United States had been from students who, from the educational and personal point of view, deserved admission.

"In addition to applicants who have not entered upon their medical curriculum in America, but have passed examinations with that object, there are some who, after a period in an American university or school have received 'honourable dismissal.' In view of the fact that those who obtain the qualifications of the Conjoint Boards in England, Scotland, and Ireland are entitled to take the examination of the National Board of Medical Examiners and, if this is passed, to obtain registration in the majority of the United States, it is highly desirable that no American students, who for one reason or another have not been considered satisfactory in their own country, should be admitted to medical schools here."

With reference to students who wish to study abroad, not because they cannot gain admission in America, but because they wish to enjoy the benefits of education abroad, the Registrar suggested that there should be no difficulty. The letter concluded by stating that the whole question would come before the Education Committee of the Council, and inviting information as to what documents American students who wish to study here should be asked to produce: (1) if they have never obtained admission to an American medical school, (2) if they have received "honourable dismissal" from an American school, and (3) if they have been satisfactory students in America and desire to enjoy the benefits of education abroad.

Dr. W. C. Rappleye, the Director of Studies of the Commission on Medical Education organised by the Association of the American Medical Colleges, who was present at the meetings of the Council held in May last, was also asked for his views, and replied as follows:—

"Thank you very much for your last letter telling about the action of the Council regarding applications from American students. I notice that the statement required is 'from the dean of a medical school which is a member of the Association of American Universities.' Only 55 of the 70 approved medical schools are in universities which are members of that Association, but all of the approved medical schools (formerly designated as Class A) are members of the Association of American Medical Colleges. I mention this because you may get a statement from one of the 15 schools which does not belong to the University Association, but which is in equally good standing and a member of the Medical School Association.

"The most common cause for not accepting applicants for admission to medical schools here is designated 'class full.' Many students rejected for that reason have met all the requirements for admission to that school, it is the least objectionable designation by which students can be rejected for personal or racial reasons. I mention this, also, because you may get statements from some of the deans over here that they would have accepted a given student if the class had not been filled.

"Possibly the best way to deal with this problem of American students in the British schools would be for you to accept no students except those who have had one or more years in an American school, and then only on evidence that the work here had been entirely satisfactory. I suppose it would be necessary to make some exceptions. As you know, there are quite a number of American students who have failed in their medical courses here that are now studying in Europe. We are very anxious to have good students from America spend time in the British schools either as a part of their undergraduate training or later in graduate work, and everyone wants to be sure that it is our good students that go over and not those who have done poorly here."

On April 22nd a reply was received from the National Board of Medical Examiners to the letter sent to them, in which they said that the matter would be brought before their executive committee which would meet on April 15th, after which they would write again. In the meantime the circular letter by the Council sent to applicants was modified by substituting the words "the dean of a medical school which is a member of the Association of American Colleges" for "the dean of the faculty of medicine of a university which is a member of the Association of American Universities."

The Registrar's memorandum closed by quoting a letter received from the National Board of Medical Examiners on May 3rd expressing appreciation of the efforts made to admit only well-qualified candidates into the medical schools of Great Britain. The difficulty was admitted of deciding in this country as to a student's eligibility who had not applied for admission to any school of medicine in the United States.

Memorandum on the Registration of Students.

A memorandum on this subject was submitted to the committee by Sir Norman Walker, the first portion of which dealt with the forms which applicants for registration as medical students are enjoined to fill up. Sir Norman Walker pointed out that the form did not receive the proper consideration by the person signing it. For example, it is not unusual to find that the parts which the teacher was unable to certify were none the less certified to by the omission to strike out certain lines in the certificate. But the gist of Sir Norman Walker's memorandum was to point out that the applications now being received from students in the United States makes the need of looking into the matter more urgent.

"The preliminary examination in general education," wrote Sir Norman, "is quite clearly within the sphere of the Council's duty under the Medical Act, but the preliminary examination in chemistry and physics is not quite so clear, and it is common knowledge that many of the universities have a marked preference for the plan of conducting the whole of the teaching in these subjects within the curriculum. The American applications are raising some difficult points, and there is a danger lest the Council should seem to interfere with the rights and prerogatives of the British medical schools. These rights, however, carry with them duties and responsibilities, and there are matters which should be seriously considered by their deans. It is presumably within the power of any school to impose any conditions it likes, even with reference to race, colour, or creed. The Medical Council has no such powers; if an applicant has passed a recognised general education preliminary, and a further recognised preliminary in elementary chemistry and physics, and has been accepted as a student by any recognised school of medicine in this country, his application for registration must be acceded to. But the deans should give very careful consideration to the international difficulties that may arise. It is well known that in the last 30 years there has been a remarkable elevation of the standard of medical education in the United States, and that the numbers applying for admission to their medical schools are straining their capacity to its limits. Thus, in 1927–28 there were 11,282 applicants, of whom only 6495 were accepted. If a student from some other country desires to study medicine in this country, and is accepted by one of our medical schools, the licensing bodies by custom accept the certificates of their teachers and admit the student to their examination. But the question is complicated by the fact that, in the American colleges, a great deal of critical attention is directed to the class work of the students, and those who, in their first or second year of work, are found deficient, receive an intimation that they will not be allowed to proceed, and a certificate that they have been 'honourably dismissed.' Persistent inquiry has elicited that the meaning of this is that they are not up to the scholastic requirements of the particular school, though there is nothing against their character, and it is this group of students that is responsible for the difficulties with which we are faced.

"As all such students have fulfilled the conditions of the approved (by the Council of Medical Education of the A.M.A.) medical colleges, which are that they must have a minimum two years (some require three or even four) in biology, chemistry, physics, and other subjects, one of which is a foreign language, they may quite properly be regarded as having fulfilled our conditions of general education, and the preliminary

examination in elementary chemistry and elementary physics. Further recognition depends on the individual licensing body in this country; some of the universities insist upon the complete curriculum being followed here, others quite legitimately recognise their chemistry, physics, and biology as equivalent to the first professional examination. If that is done the student would have to spend only four years in a medical school in this country, when, if successful, he would return to his own home with a British qualification. It is, however, to be noted that a large number of the American universities and several States require, in addition to the four years of medical study, a further year's service as an intern in a hospital or full-time work in a laboratory; thus the curriculum required for graduation is one year longer than ours. It seems highly desirable that we should not make any further concessions, and that the examinations in anatomy and physiology conducted by each individual American medical college should not be recognised as a means of further shortening the curriculum in this country. Considerable resentment is aroused by the return to his native country of a student who has completed his curriculum and obtained a British qualification in a lesser period than he would have required in his own country. This is more particularly the case in those countries where the possession of a British qualification gives the holder privileges of registration, and the result is that a student who has not completed his course for any reason in his own country gains precedence of those who have done so."

Other Committee Business.

Finance Committee.

Sir Holburt Waring moved, and Sir Norman Walker seconded, the adoption of the report of the Finance Committee which showed a satisfactory state of affairs, although there was a deficit of £7. This was anticipated and was due to the fall in the number of registrations in 1923, owing to the new regulations.

Education Committee.

In the absence of Sir Humphry Rolleston, Sir Farquhar Buzzard moved the adoption of two reports by the Education Committee. The former contained as an appendix the replies from teaching bodies to a letter asking how the pre-clinical subjects were taught in application to medicine during the three clinical years. The committee felt that the principle was still in a somewhat experimental stage and that it would be premature to come to a dogmatic decision as to the relative advantages of the several methods in use. Replies to questions on the examination in these subjects suggested that, except in applied anatomy, questions on pre-clinical subjects were seldom specifically set in final examination papers but that the questions set are believed to test the candidate's knowledge of these subjects. The second report dealt with certain matters referred to the committee. In reference to a letter received from the Society of Medical Officers of Health, on the place of preventive medicine in the curriculum, the committee recommended that the education and examination committees should examine the subject conjointly. The authorities of St. Thomas's and Guy's Hospitals had applied for permission to teach vaccination by their staffs, instead of by the public vaccinator. The matter had been referred to the Ministry of Health and the proposals put forward by the hospitals had been approved. A letter received from the Incorporated Association of Headmasters showed that the headmasters now agreed with the Council that a boy should be 17 years of age before entering a university or medical school. The headmasters thought that the first professional examination should be taken from school and that a pass in the suitable subjects in a Higher School Certificate should be grounds for exemption from the first professional examination. The committee observed that these points were matters for the licensing bodies subject to the Council's wish that these subjects should be studied in their relation to medicine.

Examination Committee.

Sir Norman Walker moved the reports of the Examination Committee. A memorandum and questionaire had been circulated to licensing bodies and teaching schools, urging the importance of pharmacology in the curriculum. The replies showed that interest was being taken in the inquiry. There was general agreement that a study of physiology should precede that of pharmacology, and in all universities except London and Wales the courses were held after the physiology examination had been passed. The average course was about 60 lectures. Most schools gave special attention to prescribing and agreed that pharmacognosy was little needed by the modern student. Practical pharmacy classes showed much variation, some authorities holding that the bedside was the proper place to observe the action of drugs, though all agreed on the need for practical instruction in dispensing and most supplied this during the clinical years. There was a tendency away from teaching pharmacology during the third year and then teaching no more of the subject. The replies to the question "Is the metric system used in teaching?" showed that it would be a long time before this system was adopted in this country. The report included a table showing the courses in hygiene and forensic medicine provided by the various licensing bodies; interesting variations were revealed. The visitation of the examinations in the latter subject being complete, the committee recommended that the Council direct that the reports of the examiners in medical jurisprudence be published as an appendix to the November report. No objection to this had been raised by the bodies concerned. The final examinations had been thoroughly inspected and the committee were thinking of turning their attention to the pre-medical subjects. Sir Norman Walker then introduced the annual tables for 1929, showing the percentage of passes in the various examinations and the exemptions from the curriculum or examinations granted by the various bodies during the year.

Restorations to the Dental Register.

The following names were restored to the Dental Register: Alfred Catlow and Harold Walmsley.

(*To be continued.*)

Nottingham City Mental Hospital.—On Jan. 1st last this hospital contained 967 patients (426 males and 528 females), in addition 62 boarded out in other institutions. Enlargement has become so urgent that a site of 24 acres has been purchased, and with the additional accommodation which will thus be provided it is hoped to house 500 patients.

Swindon Hospital Service.—It is hoped that the serious difficulties which for some years past have surrounded the hospital service of Swindon are now in a fair way of settlement. The question was recently considered by a conference convened by the chairmen of the Wiltshire public health and public assistance committees at which it was decided to refer the matter to Sir Arthur Stanley in his capacity as chairman of the Joint Council of the Order of St. John and the British Red Cross Society. There are two hospitals at Swindon, the Victoria and the Great Western Railway Medical Fund Society's Accident Hospital, which is almost entirely supported by workmen's subscriptions. Sir Arthur Stanley's report, which was published last week, recommends the extension of the Victoria Hospital to accommodate 200 beds, and that the Railway Medical Fund should make grants to cover the cost of treating its members. He proposes that a board of management should be formed upon which the hospital and the fund should be equally represented, with the addition of nominees of the local authorities and the G.W.R., and that the available capital resources should be pooled for building purposes.

Correspondence.

"Audi alteram partem."

AVERTIN ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—The strong commendations of avertin by Dr. James Young in your issue of May 31st (p. 1177) are most welcome and refreshing, whilst his equally strong condemnation of the usual methods of procuring anæsthesia should provoke reflection, if not discussion, and stimulate the search for new anæsthetic drugs. It cannot be denied that the present position is and has long been very unsatisfactory, and that anæsthetists who have tried each new drug and each new method as it has come out would receive with delight the advent of a drug which would possess all the advantages and none of the disadvantages of those in daily use. Perhaps in our endeavours to extract the best qualities and reject the worst of the common anæsthetics we have concentrated too much upon improvements in technique and not enough upon the necessity—the urgent necessity—of search for new drugs. There are, in other words, too few anæsthetics and too much apparatus. It has even been whispered, Sir, that there are too many "stunts" (if this word may appear in your columns), too little science, but this is just malicious gossip, the product of envy and uncharitableness. Whatever the truth, it would seem that little real scientific advance can be noted. Improvements in the technique of spinal analgesia, of local anæsthesia, the more frequent use of local anæsthesia combined with nitrous oxide and oxygen are all steps in the right direction, but we should not rest satisfied until a new drug or drugs have been found which will eliminate the dread and discomfort of the onset of unconsciousness, provide a safe induction, and procure adequate anæsthesia, and a recovery free from post-operative sickness and complications, whether toxic or irritant.

Avertin marks a great advance. It possesses in high degree most of these properties, and when combined with nitrous oxide and oxygen or a reduced ether anæsthesia very closely approaches the ideal. I hope sincerely that its use will increase. Its advantages are immense, and it is easy to give, easy to take. As regards the actual administration, I find that in cases of urgency the preliminary enema can be withheld; further, that I give morphine less frequently than I did, reserving its use for selected cases. Perhaps Dr. Young will find that the fall of blood pressure will be at times less pronounced if morphine is not given as a routine. Avertin by itself procures in most cases the desired deep sleep, and if the dosage has been accurately estimated (and in making this estimation the temperament and not the physique of the patient appears to be the important factor) the resulting depression of respiration never causes anxiety. It can be given more quickly than Dr. Young recommends—I find that half an hour is ample time in which to prepare the solution, supervise or at any rate initiate its injection, and have the patient ready for operation.

Due credit must be given to its distributors, Messrs. Bayer Products, Ltd., who wisely suggested to Dr. H. H. Dale that the drug should be tested by an experienced body of anæsthetists before it was placed upon the market. The control of it was therefore handed over to the Joint Committee of the Medical Research Council and the Section of Anæsthetics who issued it to authorised workers, including Mr. F. J. Morrin, of Dublin, on the condition that they reported their results to the Committee.

I am, Sir, yours faithfully,

York-terrace, N.W., May 31st. FRANCIS E. SHIPWAY.

To the Editor of THE LANCET.

SIR,—I have read Dr. Young's article with much interest and am glad to find another disciple of avertin. He mentions in his paper Morrin, of Dublin, Blomfield and Shipway, of London, as the introducers of this drug. He omits to mention the Municipal General Hospital at Bradford, which I think I am right in stating was one of the pioneers. This drug was seen in Berlin in 1927 by one of our staff who moved heaven and earth to get it. We were one of the first to receive it and to try it out. One of us saw it used by Prof. Katzenstein in his private clinic, and immediately saw its good properties. It has been used in this institution from its inception combined with only light ether application, also with regional anæsthesia, and is still being used to-day. It has been employed in several hundreds of cases and its remarkable contrast to chloroform and ether narcosis with their invidious leavings have rendered its use a routine procedure at this hospital for the past two years. I hope this hospital may be claimed a pioneer in this respect. Perhaps as a provincial hospital we have been overlooked, but we should give credit where credit is due.

I am, Sir, yours faithfully,

BASIL HUGHES, D.S.O., F.R.C.S.

Bradford, May 31st, 1930.

THE CAUSATION OF ECLAMPSIA.

To the Editor of THE LANCET.

SIR,—May I reply to the three points raised by Mr. Paramore on p. 1209 of your last issue? "Eclampsia," he says, "either is due to toxins absorbed from the gut—or it is not." It is my belief that the symptoms of the syndrome of eclampsia are usually expressions of disturbed physiological functions resulting from a damaged liver. At the outset of the disease there is no excess of toxins in the general circulation. Once the liver is unable to carry out its detoxicating functions, toxins absorbed from the gut will be carried in the blood stream to poison the tissues of the body—the kidneys as well as the heart. I stated some of the reasons why I believe that "it is abundantly clear that the kidneys are not concerned in the ætiology of eclampsia." I do not believe that there is any excess of toxins or poisons in the maternal blood for the kidneys to excrete—until the liver fails. The third question, as to whether the failure of the liver is due to overwork, I will answer in the negative. I believe it fails because the fœtus requires 8 g. of calcium, and relatively large supplies of sugar, iron, and iodine during the last four weeks of pregnancy. Prof. J. Russell Greig, of Edinburgh, has been kind enough to send me reprints of papers he has published this year in the *Veterinary Record* and elsewhere, showing that milk fever in cattle, so like eclampsia in many ways, is associated with a hypocalcæmia, and may be cured by intravenous injections of calcium gluconate. Injection of saline or air into the udder raises the blood calcium.

Mr. Paramore says I have burned my boats, but I have not done so without building a bridge. There is less room in the abdominal cavity of a primipara than of a multipara, and the intestines are more awkwardly displaced, so that the weight of the uterus is more likely to press on certain parts of them. I added two other reasons why primiparæ suffered more frequently from eclampsia—the fixing of the fœtal head at the thirty-sixth week, and last but not least the psychological traumata and anxieties associated with marriage, pregnancy, and the fear of labour. I ought to have said that my observations on the pressure in the abdomen were made with the woman flat on her back and under an anæsthetic.

I was much interested to read of Dr. Chalmers's experience with Chinese women, and am glad that he emphasised the fact that they have such unhealthy gastro-intestinal tracts. I think that sunlight is a profoundly important factor in preventing the toxæmias, and in this country it is essential, especially in Glasgow and manufacturing areas, to provide the women with vitamins by mouth. The parathyroids

are most important, but I am not aware that they have been shown to be seriously altered during pregnancy, as they control the calcium, while the thyroids are important as they apparently exercise some control on the glycogenetic functions of the body. I am, Sir, yours faithfully,

G. W. THEOBALD.

Devonshire-street, W., June 2nd, 1930.

THE MECHANISM OF PULMONARY COLLAPSE.

To the Editor of THE LANCET.

SIR,—Dr. Watson-Williams invites readers to relate their experiences of the behaviour of the lung when laid bare by wound of the chest wall. Most anæsthetists must, I think, have often been surprised in operations involving exposure of lung that this structure showed so little tendency to collapse. A remarkable illustration of an exposed lung retaining its shape and size occurred in a soldier who, in 1917, was admitted to No. 56 General Hospital, France. This patient had received a gunshot wound of the left chest with so much destruction of chest wall that the lung and heart were freely exposed, the interesting point being the apparently expansive movement in the lung during inspiration. The patient eventually recovered.

I am, Sir, yours faithfully,

Clifton, June 2nd, 1930. ARTHUR L. FLEMMING.

AREA OF PRIMARY INVOLVEMENT IN PULMONARY TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—It used to be, and may still be, taught that pulmonary tuberculosis usually commences at the left apex. I have long been doubtful whether this was a misleading statement, as from my experience of tuberculous cases I thought the chances were about equal which side was involved first. In order to satisfy myself on the point I took the first hundred unilateral cases admitted to this hospital last year, and found that 53 were right-sided cases and 47 left-sided. One of the right cases and five of the left cases had the lower lobe only involved. It would be interesting to know if these results bear out the experience of other workers.

I am, Sir, yours faithfully,

C. DENYS HANAN, M.D. Dub.,
Res. M.O. The Royal National Hospital for Consumption for Ireland.

Newcastle, Co. Wicklow, I.F.S., May 30th, 1930.

DUDLEY GUEST HOSPITAL.—Last year this hospital established an orthopædic and fracture department, and is dealing with 60 cases weekly. There were 2552 in-patients, an increase of 20 per cent. Radium to a value of between £2000 and £2500 has been acquired, and extensions of the building are overdue.

QUEEN'S NURSES AND CONTRIBUTORY SCHEMES.—At a meeting of county nursing associations last week it was agreed that every effort should be made to secure coöperation between hospital contributory schemes and the district nursing associations. It was considered that the most satisfactory arrangement was that made by the West Sussex Associated Hospital Contributory Fund whereby 1*d.* from the weekly contribution of 4*d.* is paid to the district nursing association.

STAR AND GARTER HOME.—The report for 1929 shows that there was a falling off in the ordinary income; investments produced a smaller amount, and the donations were only £423. The expenditure increased by £1671, mainly because in 1928 the Sandgate Home lacked its full complement of patients. Contributions from the Ministry of Pensions are continually diminishing. The ability of the governors to continue the future working of the homes with the same efficiency as in the past is jeopardised for these reasons and because of the probable decrease in the interest and earning power of the investments.

Parliamentary Intelligence.

HOUSE OF LORDS.

MENTAL TREATMENT BILL.

THURSDAY, MAY 29TH.

The House considered the Commons Amendments to the Mental Treatment Bill.

Earl RUSSELL (Under Secretary for India) said that although the list of amendments was rather long, by far the larger number were drafting amendments.

"Incapable of Volition."

Viscount BRENTFORD said that his view in regard to many details of the Bill was still as strong as it was when the measure was last before their lordships. It was the first time, he thought, that voluntary patients had been allowed to place themselves in what was called a lunatic asylum, and without any certification or any reception order. They could be placed there by their relations, again without any certificate, and when a man had been sufficiently lacking in volition to place himself as a voluntary patient he could be detained without being certified by any judicial body. He could even, if he recovered his sanity, or if he became capable of volition, still be kept for 28 days, although *ex hypothesi* he was again quite sane, and he could also, by order of the representatives of the Board of Control, be kept without any judicial decision for six months. That was a provision of the Bill to which he took the very gravest exception. In his view a certificate with a judicial authority was the greatest safeguard for the liberty of the subject. However, he realised that their lordships and the majority in the Commons had taken the view that his (Lord Brentford's) opinion was wrong. He had no wish to play the part of Athanasius *contra mundum*. But Athanasius might have been right, and the world might have been wrong, and the world might subsequently, when the Bill came to be reconsidered by another Royal Commission on the Lunacy Laws, think that the present Bill had gone too far. But with this restatement of his own views on the subject he did not propose to offer any further opposition to the Bill.

Protection against Vexatious Actions.

On Clause 16 Earl RUSSELL referred to the amendment inserted in the Commons for the purpose of giving protection to the medical profession against vexatious actions. The amendment, he said, did to some extent strengthen the clause, and he therefore recommended their lordships to agree with it.

Viscount BRENTFORD said that this amendment was an extension of the clause as originally drafted, and he thought that it did not apply only to the medical profession, but to any one who had taken part in putting a man into what was now called a home. It made it impossible for any man who had been put in an asylum wrongfully by his family, or by a medical man signing a reception order, to get any redress without first going to the High Court and establishing that he had a prima facie case. That was a very unusual procedure to take. The responsibility must be on the Government for carrying the clause in this form.

Lord DANESFORT asked if there was any precedent in a case of this sort for procedure of this kind?

Lord DARLING said that there was already on the Statute Book such a provision, and the courts had acted on it frequently. There were people who apparently had an *idée fixe* and who were a positive nuisance.

The Earl of HALSBURY said that Lord Darling apparently assumed that a person who had been wrongfully shut up in an asylum had an *idée fixe*. The whole basis of the action was that he had not got an *idée fixe*, and he (Lord Halsbury) failed to see that that had anything to do with the matter raised by Lord Danesfort.

Earl RUSSELL said that he did not propose to follow noble and learned lords into legal subtleties, but it was felt that more protection should be given to the medical profession. He thought that one might safely say that nobody with a genuine case would be stopped by this provision from starting his case. It was only a person who imagined that he had a case and, in fact, had none, who would be stopped from giving all this trouble and causing all this expense.

The amendment was agreed to.

Accounts of Licensed Houses.

On Clause 17 Earl RUSSELL moved that the House agree with an amendment inserted by the Commons providing

that the accounts of licensed houses should be kept as the Board of Control prescribed, and should be audited once a year by direction of the Board.

The Earl of HALSBURY moved the rejection of the amendment. He said that he could understand that licensed houses should have every proper supervision to prevent abuse and so on, but they were private ventures, and he failed to see what excuse there was for saying that the accounts of a private venture should be gone into. The matter was even worse than that, because the whole or any part of the accounts could be published, and the publication of part of a document might be very misleading. Any comment could be made on a part of the audit which the Board of Control might choose to publish. The clause went too far, and he hoped that it would be left out of the Bill.

Earl RUSSELL said that no concern which was officially allowed to have the charge of a certified lunatic could possibly be regarded as a private concern. It was clearly one in which the public had a direct and over-riding interest.

The Earl of HALSBURY said that he meant that a licensed house was a purely private concern as far as regarded its financial running, and this clause dealt with the financial running and nothing else.

Earl RUSSELL said that that was a matter in which the public were profoundly interested, and it was, above all, a case in which duty might very easily conflict with interest. Their lordships would recall that the Royal Commission were divided half and half as to the retention of licensed houses. The Government did not desire to deal with licensed houses in this Bill, but this amendment was put in by the Commons on the advice of friends of Lord Halsbury, and the Minister of Health somewhat reluctantly accepted it. Although the Royal Commission were divided as to the retention of licensed houses they were agreed that if they were retained it was proper that a power of this character should exist.

Viscount BRENTFORD asked what advantage could it be to the administration of the Lunacy Law to publish private accounts of the running of an institution which was carried on under supervision in regard to certain respects, but which merely took in private persons whose friends paid what they regarded as a reasonable fee for such accommodation?

Earl RUSSELL said that he did not think that this was a matter so much of the fees charged to the patient. Those fees were a matter of bargain between the friends of the patient and the keeper of the licensed house. The latter might charge whatever he was able to get, and there was nothing improper in that. But the sort of question which came before the Royal Commission, and which they thought was very undesirable, was a case where the superintendent of a very important house of this character was paid partly by commission on the profits. Then there were cases in which articles had been supplied to patients while there, and prices had been charged sometimes considerably in excess of their cost to the institution. There were two possible views about that. One view was that the keeper of the institution was a hotel keeper and was entitled to charge his guests anything he could make out of them. He thought their lordships would agree that the better view was that the keeper of the licensed house was not entitled to charge his patients more than the cost price, plus something, perhaps, for establishment or overhead charges, and that in any case the prices charged, if more than the sums actually paid, ought to be disclosed to the persons paying the accounts. The case which was gone into as a matter of fact by a special audit by the Royal Commission was rather a bad case and raised some apprehension in their minds. He was sure that their lordships would not conceive that any portion of these accounts was likely to be published unless there was something that amounted to a perfectly definite public scandal which ought to be shown up and held up to public odium and execration.

Lord CARSON said that this amendment was really one more of those persistent attempts to get everyone under the control of Government Departments, which were found in every Bill which came before Parliament. Many people selected these mental homes because they were known to be conducted by kindly people who looked well after the patients and made a reputation for themselves. If there was a scandal, or anything like a scandal, the thing to do was to withdraw the licence. For heaven's sake do not let them on such pretexts put an end to these private homes, which from his experience of various cases which had been brought before the courts he thought were of great service. Do not let them say that everybody must be put under the Board of Control. If this amendment was left in the Bill these private homes had better be shut up altogether.

The motion to agree with the Commons amendments was rejected by 31 votes to 17.

HOUSE OF COMMONS.

THURSDAY, MAY 29TH.

Exhibition of Vivisection Film.

Mr. FREEMAN asked the Home Secretary whether his attention had been called to a film shown publicly at the Professional Nursing, Midwifery, and Public Health Exhibition, Horticultural Hall, Westminster, on March 6th, 1930, illustrating vivisection experiments on certain animals, including a dog, performed by Dr. H. H. Dale; and, in view of the provisions of the Cruelty to Animals Act—viz., that an experiment must be performed with a view to the advancement of new discovery of physiological knowledge or of knowledge which would be useful for saving or prolonging life or alleviating suffering, what action he proposed to take in the matter.—Mr. CLYNES replied: If the hon. Member will refer to section 3 of the Act, he will see that the words which he quotes are qualified by a proviso which expressly lays down that experiments may be made for the purpose of illustrating lectures in medical schools, hospitals, colleges, or elsewhere, with a view to instruction in physiological knowledge or knowledge which will be useful in saving life or alleviating suffering, on the appropriate certificate (C) being given by the scientific authorities mentioned in the Act. The experiments referred to in the question were performed under the authority of such a certificate, and no action on my part is necessary or possible.

Mr. FREEMAN: Does the right hon. gentleman consider that a film of this character exhibited to the public, and not to students only, comes under the category?

Mr. CLYNES: I have referred to the terms of the Act. The proviso in question is highly technical and scientific, and if my hon. friend wishes to press any other point, I should require notice of it.

Lieut.-Commander KENWORTHY: Would my right hon. friend consider some action in the case of this film, since the very fact of it being shown must be painful to many animal lovers?

Mr. R. S. YOUNG: Has the film been passed by or submitted to the London County Council?

Mr. CLYNES: I am afraid that I personally, as representing the Home Office, have no control over the exhibition of films for scientific purposes.

Psychotherapeutic Treatment.

Mr. MANDER asked the Home Secretary whether, in the event of persons being referred by the Juvenile Courts for psychotherapeutic treatment, any contribution was made from public funds towards the cost.—Mr. CLYNES replied: If the hon. Member has in mind treatment as distinct from observation and examination, the answer is in the negative.

Mr. MANDER: Does the Home Office possess any power under any Act to grant such maintenance or assistance?

Mr. CLYNES: Not as far as I know.

Treatment of Juvenile Offenders.

Mr. CADOGAN asked the Home Secretary whether it was still his intention to introduce legislation to amend the Children Act of 1908, incorporating the recommendations of the departmental committee on the treatment of young offenders; and when such legislation would be introduced.—Mr. CLYNES replied: Yes, Sir. I hope it may be possible to introduce a Bill in the autumn, but the hon. Member will not expect me to make a definite promise.

Ptomaine and Food Poisoning.

Sir WALTER PRESTON asked the Minister of Health if he would allow the Ministry's officials during the coming summer to watch carefully cases of ptomaine and food poisoning and, if they found them seriously on the increase, to inquire whether such were due to the absence of preservatives in food which was now enforced.—Miss S. LAWRENCE, Parliamentary Secretary to the Ministry of Health, replied: It has been the practice of my Department for some years past to inquire into the causes of all food poisoning outbreaks of special interest, and this practice will be continued. Since the Preservatives Regulations came into operation, no cases have been reported in which the outbreak could be attributed to the prohibition of the use of preservatives, and my right hon. friend is advised that boric acid as formerly used for preservative purposes is ineffective in preventing the development of food poisoning organisms.

Sir WALTER PRESTON: Will the hon. lady inquire of the medical profession whether there is not a large increase of these cases of ptomaine poisoning?

Miss LAWRENCE: I have no reason to believe that is so, but I will look into the matter and communicate with the hon. Member.

Health Insurance Benefits.

Sir KINGSLEY WOOD asked the Minister of Health the amount of additional sickness, disablement, and maternity

benefits paid, respectively, during the last six months above the normal rate to members of the Navy, Army, and Air Force Insurance Fund who had continued their membership after discharge from His Majesty's Forces; also the value of the payments made for such period in respect of dental treatment, the provision of artificial teeth, ophthalmic treatment, the provision of spectacles, and the provision of medical and surgical appliances.—Miss LAWRENCE replied: The following is the information asked for:—The amounts of additional cash benefits paid to readmitted members of the Navy, Army, and Air Force Insurance Fund during the six months ended 31st March, 1930 (the last date up to which accounts have been made up), were as follows: Sickness benefit, £2562 10*s.* 4*d.*; disablement benefit, £4359 0*s.* 10*d.*; and maternity benefit, £225. The amounts paid for additional treatment benefits during the same period were: Dental benefit (including dentures), £6018 0*s.* 6*d.*; ophthalmic benefit (including spectacles), £471 11*s.* 9*d.*; and medical and surgical appliances, £162 17*s.* 2*d.*

Dangers of Machine-skimmed Condensed Milk.

Sir CHARLES CAYZER asked the Minister of Health whether, in view of the recent death of a child at Grimsby as a result of eating food made from imported machine-skimmed condensed milk, he would consider banning the import of such milk in the interests of public health.

Lieut.-Colonel HENEAGE asked the Minister of Health if his attention had been called to cases of illness and death of children caused by skimmed milk or tinned milk imported from foreign countries; and if he would consider prohibiting the importation of such milk.—Miss LAWRENCE replied: My right hon. friend has made inquiries into the case to which he assumes Sir C. Cayzer refers. He is not aware of any similar case. In that case the medical witness at the inquest stated that the child, who had not received medical attention, died from gastroenteritis which might have been set up by dirty food conditions. It was also stated that, though the child appeared to be well nourished, his diet was injudicious, and had included a meal of corned beef and suet pudding. The machine-skimmed milk was not made up as a drink, but had been used for making milk puddings. My right hon. friend sees no reason from a consideration of the circumstances of this case for prohibiting the importation of condensed machine-skimmed milk.

Smoke Abatement By-laws.

Captain PETER MACDONALD asked the Minister of Health in how many cases local authorities had made by-laws under the Smoke Abatement Act, 1926; and whether he had in any case exercised his compulsory powers respecting the making of by-laws.—Miss LAWRENCE replied: By-laws under section 2 of the Act of 1926 have been made by 112 local authorities. My right hon. friend has not thought it necessary in any case to exercise the power of requiring these by-laws to be made.

Milk Production.

Mr. GOULD asked the Minister of Agriculture if he could give any estimate of the production of milk in this country for 1930, and the figures for 1928 and 1929.—Dr. ADDISON replied: An annual estimate of the total milk production (excluding milk fed to stock) in England and Wales is made on the basis of the yield per head of the dairy herd as ascertained in the census year June, 1924–May, 1925. On this basis the total production for the period June, 1926–May, 1927, was 1152 million gallons; for 1927–28, 1147 million gallons; and for 1928–29, 1131 million gallons.

Misuse of Maternity Benefit.

Mr. RAMSBOTHAM asked the Minister of Health whether he was aware that the maternity benefit was sometimes used, not for the benefit of the mother, but for other family purposes; and whether his department had taken any steps to ensure the proper application of this allowance.—Mr. GREENWOOD replied: It is laid down in the National Health Insurance Act that maternity benefit shall in every case be the mother's benefit, and must in all cases be paid to her. Under the present arrangements for the administration of the benefit, the amount once paid over to the mother is at her disposal, and so far as I am aware it is almost invariably used in meeting the various expenses consequent upon her confinement. So long as this method of administering the benefit is continued I do not see what steps my Department could take to control the method of application of the money by the mother.

Indian Medical Service Pensions.

Replying to Major Graham Pole, Mr. WEDGWOOD BENN (Secretary of State for India) stated that the number of officers of the Indian Medical Service who drew pensions through the India Office chargeable to Indian Revenues during the year ended March 31st, 1930, was 569, and the amounts paid totalled £331,513.

A Schoolboy's Mental Condition.

Mr. MANDER asked the Home Secretary if his attention had been called to the case of George Collier, aged 15, who was certified insane after two attempts at murder and an attempt at suicide at the Philanthropical Society's school at Redhill, where he was sent for another assault occasioning bodily harm; what measures were taken to ascertain Collier's mental condition before going to Redhill; and what action he proposed to take to prevent such an occurrence in future.—Mr. CLYNES replied: Yes, Sir. Before the lad was sent to the school he was carefully examined by a prison medical officer with special reference to his mental condition, but at that time there were no indications of the insanity which unhappily manifested itself after his arrival at the school. I am satisfied that every possible care was taken and that the exceptional circumstances of this case do not call for any general action.

MONDAY, JUNE 2ND.

International Conference on Narcotics.

Lieut.-Colonel FREMANTLE asked the Home Secretary if he was taking steps to summon a preliminary conference of countries manufacturing narcotics with a view to limitation of their output, as suggested on behalf of Great Britain at Geneva on May 14th last; and if the Soviet Republic would be invited to participate in any such conference.—Mr. SHORT (Under Secretary to the Home Office) replied: My right hon. friend is afraid he is not in a position to make any statement on the subject at the present time.

Milk Rations for School-children.

Mr. FREEMAN asked the President of the Board of Education what steps he was taking to secure that every scholar had a daily ration of milk during school hours where desired.—Mr. MORGAN JONES (Parliamentary Secretary to the Board of Education) replied: This is primarily a matter for the local education authorities; but my right hon. friend is coöperating with the National Milk Publicity Council in their endeavours to secure that arrangements for the supply of milk are made in as many schools as possible.

Government and Factory Legislation.

Viscount WOLMER asked the Prime Minister whether it was intended to introduce a Factories Bill, a Bill enforcing the Washington Eight Hours Convention, or a Bill repealing the Trade Union Act, 1927.—Mr. MACDONALD (Prime Minister) replied: As regards the Bill to amend the Trade Disputes and Trade Unions Act, 1927, I have nothing to add to the replies already given on this subject. The Hours of Industrial Employment Bill has already been introduced, but, as I stated on the 27th May, it is not at present possible to say when the further stages will be taken. The question of the date of introduction of the Factories Bill is still under consideration.

Discharge of a Hospital Orderly.

Mr. W. G. HALL asked the Minister of Pensions, if, in view of the circumstances under which Mr. W. E. Fox was recently discharged from the staff of the Ministry of Pensions Hospital, Cosham, Portsmouth, he would have inquiry made into this case with a view to some compensation being granted.—Mr. F. O. ROBERTS replied: The services of this orderly were dispensed with because by his own acts he had brought about a state of affairs in which his retention would have been prejudicial to the patients in the Cosham Hospital. He was given a fortnight's notice of the termination of his appointment, a longer period than that required by the conditions of his employment, and no claim to compensation arises.

TUESDAY, JUNE 3RD.

Health Insurance Appeals.

Mr. RHYS DAVIES asked the Minister of Health if he would issue a table showing the number of appeals made to his department by insured persons against the refusal of societies to meet their claims for sickness or disablement benefit, giving the figures of the number of appeals allowed and disallowed for each of the last three years.—Mr. GREENWOOD replied: The number of appeals made under Section 90 of the National Health Insurance Act, 1924, to the Minister by insured persons in respect of claims for sickness and disablement benefit, and the number of such appeals which have been allowed and disallowed during the last three years, are given in the following table:—

	1927–1928.	1928–1929.	1929–1930.
Total number of such appeals ..	55	57	78
Number allowed	20	25	28
Number disallowed	35	32	50

An Official Notice to Doctors.

Lieut.-Colonel HENEAGE asked the Chancellor of the Exchequer whether he was aware that notice No. 37, Sec. 41,831/1929 was sent out by the Commissioners of

Customs and Excise registered to doctors; how many were sent out, and at what cost for registration alone; and what was the object of registering this leaflet.—Mr. SNOWDEN (Chancellor of the Exchequer) replied: The Commissioners were advised that it was desirable to ensure that the contents of the notice, to which the hon. and gallant Member refers, were effectively brought to the knowledge of the persons concerned, and they were therefore either delivered personally, where this was practicable, or were sent by registered post. Particulars of the numbers delivered by post and, in consequence, the cost of registration, cannot be ascertained without undue labour.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

THE following appointment has been made: Surg. Lt. T. L. Cleave to *Beaufort*.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Lt. (D) J. E. Daniels to be Surg. Lt. (D).

ROYAL ARMY MEDICAL CORPS.

Capt. D. Crellin, *M.C.*, to be Maj.
Lt. J. W. Eames to be Capt.

ARMY DENTAL CORPS.

Capt. T. Edwards to be Maj.

ARMY RESERVE OF OFFICERS.

Lt.-Cols. F. J. Palmer, J. Tobin, and H. A. Davidson, having attained the age limit of liability to recall, cease to belong to the Res. of Off.

Lt. G. R. A. de M. Rudolf to be Capt.

TERRITORIAL ARMY.

Capt. D. Lamont to comd. 5th (Scottish) Hygiene Co., vice Capt. J. A. Bingham, vacated.

To be Lts.: A. Glen (late R.G.A., Spec. Res.), P. Malpas (late Offr. Cadet, Liverpool Univ. Contgt., Sen. Div., O.T.C.), W. H. Dowell (late Cadet, Oundle Sch. Contgt., Jun. Div., O.T.C.), and H. W. Bambridge.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt. R. N. Kinnison, from Active List, to be Lt.

INDIAN MEDICAL SERVICE.

Lt.-Col. G. C. L. Kerans to be Col.

Lt.-Col. J. Husband to be Col.

The undermentioned officers retire: Lt.-Cols. C. H. Fielding and C. B. McConaghy.

The following command changes of R.A.M.C. officers in India are notified: Lt.-Col. P. J. Hanafin to the British Military Hospital at Bangalore; Maj. F. S. Gillespie to the British Military Hospital at Madras (temporary), relieved by Lt.-Col. C. J. Wyatt; Col. J. C. Kennedy, officiating D.D.M.S., Southern Command; Lt.-Cols. C. White, officiating commandant of the Colaba Hospital; and E. A. P. Brock to the Poona Hospital; Majs. H. P. Rudolf, specialist, Madras District; A. D. Fraser, to the British Military Hospital at Kamptee; and R. W. D. Leslie to the British Military Hospital at Pachmarhi.

HONORARY SURGEONS TO THE KING.

Maj.-Gen. H. Ensor, C.B., C.M.G., C.B.E., D.S.O., late R.A.M.C., vice Maj.-Gen. R. S. Hannay, C.B., C.M.G., D.S.O. (ret.), and Lt.-Col. (temp. Col.) G. de la Cour, O.B.E., R.A.M.C., promoted Bt.-Col., vice Maj.-Gen. J. S. Gallie, C.B., C.M.G., D.S.O. (ret.), have been appointed Honorary Surgeons to the King.

MANFIELD HOSPITAL CONVALESCENT HOME.—Mrs. Shipman has given her residence, Templemore, and the two acres in which it stands, as a convalescent home for Manfield Orthopædic Hospital, Northampton.

A PLAGUE OF ANTS.—The Queen Victoria Hospital, Morecambe, is said to be suffering from a plague of ants which crawl about the floors and infest the patients' lockers. Some of the flooring is being taken up in the hope of tracing the trouble to its source, "and the advice of an insectologist is being sought." There was similar trouble about this time last year, and it was hoped that a recurrence of the visitation had been prevented.

Medical News.

UNIVERSITY OF CAMBRIDGE.—On May 31st the following degrees were conferred:—

M.D.—L. S. Fry, L. P. L. Firman-Edwards, Reginald Hilton, J. V. Fiddian, and B. E. Schlesinger.

M.B. & B.Chir.—Charles Hill, G. E. Parker, and J. E. Semple.

M.B.—J. C. C. Poole.

UNIVERSITY OF LONDON.—The Senate invite applications for the Graham Scholarship in Pathology (£300 per annum for two or more years, tenable at University College Hospital) and for the Laura de Saliceto Studentship for Cancer Research. Particulars will be found in our advertisement columns.

AUSTRALIAN AND NEW ZEALAND MEDICAL ASSOCIATION IN ENGLAND.—The summer dinner of this association will be held at the Trocadero Restaurant, Piccadilly, on Friday, June 13th, at 7.45 for 8 P.M. Mr. T. P. Dunhill will preside and Sir Neville Howse, V.C., will be present as the official guest of the association. All medical visitors from Australia and New Zealand, whether members of the association or not, are invited to attend. The hon. secretary's address is 26, Queen Anne-street, London, W. 1.

MEDICAL SOCIETY OF LONDON.—The officers of this society elected for the forthcoming session are as follows: President: Dr. R. A. Young. Vice-Presidents: Dr. F. J. Poynton, Mr. Herbert Tilley, Mr. V. Zachary Cope, and Dr. J. Seymour Maynard. Hon. treasurer: Mr. H. W. Carson. Hon. librarian: Dr. A. F. Voelcker. Hon. editor: Mr. T. P. Legg. Hon. secretaries: Dr. A. Hope Gosse, Mr. W. E. Tanner, and (for foreign correspondence) Dr. Herbert Spencer. Council: Mr. Donald Armour, Mr. Carter Braine, Mr. W. R. Bristow, Dr. Walter Carr, Mr. R. Davies-Colley, Mr. Tudor Edwards, Dr. Anthony Feiling, Mr. Eric Pearce-Gould, Dr. F. E. Larkins, Dr. J. D. P. McLatchie, Mr. L. E. C. Norbury, Dr. B. T. Parsons-Smith, Mr. J. E. H. Roberts, Mr. F. H. Robbins, Dr. B. E. Schlesinger, Sir John Thomson-Walker, Dr. Lennox Wainwright, Mr. C. P. G. Wakeley, Dr. F. M. R. Walshe, and Mr. F. A. Williamson-Noble.

MENTAL AFTER-CARE ASSOCIATION.—Prince George presided at the jubilee meeting of this association on June 2nd, and stated that nearly 19,000 patients had been helped since the work began in 1879. Only lack of funds prevented the further expansion which was desirable. Sir Maurice Craig said that ex-patients found in the association a group of people who were willing to help not only with money but with understanding. Valuable work was also done in preventing first breakdowns, and cases of this kind were often sent from general hospitals and elsewhere. Mr. L. G. Brock, chairman of the Board of Control, said it was because the association provided the right kind of help that it was one of the few organisations to which his department was able to subscribe. He hoped that local authorities would support such work financially.

ROYAL VISITS TO HOSPITALS.—On Thursday last week Princess Beatrice laid the foundation-stone of the new Kensington, Fulham, and Chelsea General Hospital in Richmond-road, Earl's Court, which, when completed, will contain 112 beds. At first two-thirds only of the scheme will be carried out, with 76 beds and an out-patients' department. The cost of this will be about £70,000, of which over £30,000 has been raised. A promise of £10,000 has been made anonymously on condition that five beds are endowed at a cost of £1000 each.—On the same day Prince and Princess Arthur of Connaught were present at the "house warming" given by the lady superintendent and the nursing staff of the Middlesex Hospital to view the new nurses' home in Foley-street. The first section of the building is already occupied, and the second is nearing completion. The building contains 225 bedrooms in four schemes of colour—blue, blue and cream, green, and orange. Among the amenities are a swimming pool, a roof lounge, badminton courts, reading room, and smoking room.—On Saturday Prince George opened the Winford Orthopædic Hospital, to which the inmates of the Orthopædic Hospital at Redland, Bristol, and the patients of the Bristol Crippled Children's Society are being removed. The building, which is the nucleus of a larger scheme providing for 160 children, will accommodate 60 patients. It consists of an administrative block, a treatment block, a large open pavilion divided into two wards with a broad concrete terrace in front; in the treatment block there are an operating theatre, an X ray room, and the necessary appurtenant buildings. The hospital has been erected at a cost of £62,000 on a spur of the Mendip Hills.

UNIVERSITY OF EDINBURGH.—Sir James Barrie, O.M., has been elected Chancellor of the University in succession to the late Lord Balfour.

PADDINGTON MEDICAL SOCIETY.—The inaugural meeting of this society will be held at 9 P.M. on Tuesday, June 10th, at the Paddington Town Hall. The acting hon. secretary is Dr. J. Cohen, 23, Westbourne Park-road, London, W. 2.

INFANTS HOSPITAL.—Over £100,000 has now been subscribed towards the extension of this hospital in Vincent-square, Westminster. Last year the hospital's convalescent home at Burnham received 119 patients, who stayed an average of 50 days.

LONDON SMALL-POX HOSPITALS.—The Public Health Committee of the London County Council has agreed to continue until the end of the year the agreements made by the Metropolitan Asylums Board with certain extra-metropolitan authorities for the reception of cases of small-pox occurring in their districts into the Board's small-pox hospitals. The agreement with the Middlesex County Council is to be reviewed in November next.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.—The sixteenth annual conference of this association will be held from July 3rd to 5th at the British Medical Association's house in Tavistock-square, London, W.C. It will be opened on July 3rd by Mr. Arthur Greenwood, Minister of Health, and Sir George Newman and Dr. J. Parlane Kinloch will introduce a discussion on the effects on the Tuberculosis Campaign of the Local Government Act, 1929. On the following day Major Walter Elliot, M.P., will open the conference and the discussion will be continued.

MEMORIAL TO A MEDICAL MAN.—A fund has been raised in memory of Dr. William Andrew MacWilliam, who practised for 15 years at Norbury, and died last February. It has been decided to allocate the money as follows: £100 for a memorial shelter on Pollards Hill recreation ground, Norbury; £100 for a bed in St. Mary's Maternity Hostel, Croydon; £50 for a cot in the same institution; and the remainder (about £200) for radium for Croydon General Hospital.

POOR-LAW MEDICAL OFFICERS' ASSOCIATION.—The annual meeting of this association will be held at 6 P.M. on Thursday, June 12th, in the Holborn Restaurant, and will be followed by an informal dinner. Sir Arthur Newsholme will preside and Prof. Major Greenwood, F.R.S., will introduce the subject of post-graduate education for the local government medical service. Poor-law or local government medical officers are invited to attend, and further particulars may be had from the hon. treasurer, Mr. F. Greenwood, Bank Chambers, High-street, Stoke Newington, N. 16.

ELDERLY NURSES' PERMANENT HOME FUND.—A scheme has been prepared with the object of providing a home for elderly nurses who are no longer able to earn a living by the practice of their profession. The site chosen for the home is Bournemouth, whose mayor and mayoress are supporting the movement, but the home is not to be confined only to those who have worked or lived in the town. Contributions should be sent to the Hon. Treasurer of the Fund, Mr. F. Cobley, Westminster Bank, Southbourne, Bournemouth.

AN ABERDEENSHIRE COTTAGE HOSPITAL.—Colonel Farquharson, of Invercauld, Provincial Grand Master of Aberdeenshire, recently laid, with masonic honours, the foundation-stone of the Nicoll Hospital in the village of Rhynie, in north-western Aberdeenshire. The late Dr. P. J. S. Nicoll, a native of the parish, who practised in London and died in 1926, bequeathed £5000 towards its erection, a sum subsequently augmented by the gift of £3000 from his friend, Mr. Theodore Godlee. The hospital contains six beds.

MEDICAL GOLFING SOCIETY.—The annual summer meeting was held at Walton Heath on May 29th. Over 100 members competed, and enjoyed the hospitality of Lord Riddell. The various competitions resulted as follows: THE LANCET Challenge Cup: W. Rowley Bristow, after a tie with C. Max Page, at 1 down. Milsom Rees Challenge Cup: M. G. Mayou, after a tie with J. W. Harrison, at 5 down. Henry Morris Challenge Cup: A. Don, 3 up. Veterans' Cup: A. Don, 3 up; George Dawson, 2 up. Handicap prizes.—Class 1: C. Max Page, after a tie with W. Rowley Bristow, at 2 up. Best last 9: H. C. Apperley, 1 up. Class 2: (1st) A. Don, 3 up; (2nd) George Dawson, 2 up. Best last 9: J. W. Harrison, 3 up. Foursomes: (1st) T. J. Kelleher and J. Grace; (2nd) Lindsay Rea and W. McCullagh.

STRANGEWAYS RESEARCH LABORATORY, CAMBRIDGE.—A course of instruction in the technique of tissue culture will be given at this laboratory from July 1st to 29th. Only a limited number of applicants can be received, and those wishing to take the course should communicate with Dr. H. B. Fell at the laboratory.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—The College is to be closed on Saturday, June 7th, and Monday, the 9th.

CONFERENCE ON CREMATION.—The ninth annual conference of the Federation of Cremation Authorities will be held at Edinburgh and Glasgow from July 4th to 8th. The federation's address is 37, York-street, Manchester.

A LONG WAITING LIST.—The Cumberland Infirmary's waiting list now exceeds 700, and the public assistance committee is being urged to prepare its scheme under the Local Government Act as speedily as possible.

VENTNOR CONSUMPTION HOSPITAL.—Of the 168 beds at the Royal National Hospital for Consumption, at Ventnor, 165 were, on the average, in constant occupation last year. The annual report states that in nearly every case in which early treatment had been sought there was an improvement.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
FRIDAY, June 13th.—5 P.M., OPHTHALMOLOGY. Election of Officers and Council. Paper: Mr. Tudor Thomas: An Experiment in Keratoplasty.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
THURSDAY, June 12th.—5 P.M., Sir Charles Martin: The Thermal Adjustment of Man to External Conditions, more particularly those pertaining to Warm Climates. (First Croonian Lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, June 9th, to SATURDAY, June 14th, MEDICAL SOCIETY OF LONDON, 11 Chandos-street, Cavendish-square, W. Special M.R.C.P. lectures at 8.30 P.M. Tues., Dr. H. Gardiner-Hill: Recent Work on the Ductless Glands. Fri., Prof. Hugh McLean: Recent Research on Gastric Physiology and Pathology and its Bearing on Treatment. Further particulars from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
WEDNESDAY, June 11th.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat, and Ear Clinics. Operations.
FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M., Medical, Surgical, and Children's Diseases Clinics. Operations.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
TUESDAY, June 10th.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Mr. Hamblen Thomas: Throat, Nose, and Ear Dept. 3 P.M., Sir Henry Simson: Gynæcological Ward.
WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Simmonds: Surgical Wards. Dr. Scott Pinchin: Medical Out-patients.
THURSDAY.—10 A.M. to 1 P.M., Neurological Department, Demonstration of Fractures. 2 P.M., Medical, Surgical, Eye and Genito-Urinary Departments.
FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Department. 2 P.M., Mr. Sinclair: Operations.
SATURDAY.—9 A.M., Mr. Vlasto: Throat, Nose, and Ear Operations. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Children's Department.
Daily, 10 A.M. to 5 P.M., Medical, Surgical, and Special Out-patients, Operations, Wards Visits, Anæsthetic Courses.

NATIONAL HOSPITAL, Queen-square, W.C.
TUESDAY, June 10th.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Martin: Cerebral Vascular Disease.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Riddoch: Neurosyphilis.
FRIDAY.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Symonds: Minor Mental Disorders.

ST. MARY'S HOSPITAL INSTITUTE OF PATHOLOGY, W.
THURSDAY, June 12th.—5 P.M., Col. L. W. Harrison: The Development of the Modern Treatment of Syphilis.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.
TUESDAY, June 10th.—5 P.M., Dr. H. C. Lucey: Clinical Pathology of Pregnancy.

Appointments.

BAMBER, G. W., M.B., B.Ch. Camb., M.R.C.P. Lond., has been appointed Dermatologist to the Metropolitan Hospital, Kingsland-road, E.

PARRY, R. H., L.R.C.P. Lond., M.R.C.S., Medical Officer of Health for Bristol.

WOODD WALKER, G. B., M.B. Camb., F.R.C.S. Eng., Assistant Surgeon to the West London Hospital.

Vacancies.

For further information refer to the advertisement columns.

Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £110.

All Saints' Hospital, 91, Finchley-road, N.W.—H.S. At rate of £150.

Altrincham General Hospital, Cheshire.—Sen. H.S. Also Jun. H.S. At rate of £150 and £120 respectively.

Barnsley, Beckett Hospital and Dispensary.—H.P. £200.

Bath, Royal United Hospital. H.P. £120.

Birmingham General Hospital.—Two Anæsthetists. £120. Also H.P. and Two H.S.'s. Each £70.

Birmingham, Queen's Hospital.—H.P.'s, and H.S.'s to Special Depts. Each at rate of £70.

Blackburn Royal Infirmary.—Res. H.P. £175. Also 4th H.S. £150.

Bolingbroke Hospital, Wandsworth Common, S.W.—Res. M.O. £200.

Bristol, City and County of.—Chief Asst. M.O.H., &c. £800.

Bristol General Hospital.—Hon. Clinical Assistants.

Cancer Hospital, Fulham-road, S.W.—Pathologist. £850.

Cardiff, Cefn Mably Hospital, Michaelstone-y-Vedw, near Newport.—Asst. Res. M.O. £250.

Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall, Great Barrow.—Asst. M.O. £275–£300.

Chesterfield and North Derbyshire Royal Hospital.—Cas. O. At rate of £200.

Dartford, Kent, Southern Hospital.—2nd Asst. M.O. £550.

Derby, Derbyshire Royal Infirmary.—Asst. H.S., and Cas. O. Also Ophth. H.S., and Res. Anæsthetist. Each £150.

Doncaster Royal Infirmary.—Second H.S. and Third H.S. Each at rate of £150. Also Hon. Phys. and Pathologist. £250.

Down County Regional Education Committee.—Asst. Sch. M.O. £600.

Dreadnought Hospital, Greenwich.—H.P. and H.S. At rate of £110.

Freemasons Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Res. M.O. At rate of £250.

Gloucestershire Royal Infirmary and Eye Institution.—H.P. and H.S. At rate of £135 and £100 respectively.

Great Yarmouth General Hospital.—H.S. £125.

Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—H.S., H.P., and Cas. Surg. O. Each at rate of £100.

Hull Royal Infirmary.—H.S. At rate of £150.

Hyde, Borough of.—M.O., &c. £800.

Indian Medical Service.—Commissions.

Ipswich, East Suffolk and Ipswich Hospital.—H.P. £120.

Lenham, Kent, County Sanatorium.—Locum Tenens. 8 gns. per week.

Liverpool, St. Paul's Eye Hospital.—H.S. At rate of £120.

L.C.C.—Assistant Organisers for Children's Care Work. 66*s.* 6*d.* weekly.

London Female Lock Hospital, 283, Harrow-road, W.—H.S. £150.

London Panel Committee, 17, Russell-square, W.C.—Organising and Asst. Med. Secy. £600.

London Skin Hospital, 40, Fitzroy-square, W.—Hon. Phys.

London University.—Graham Scholarship in Pathology. £300. Also External Examinerships.

Manchester, Ancoats Hospital.—H.S. At rate of £100. Also Clin. Asst for Ear, Nose and Throat Dept. 10*s.* 6*d.* per clinic.

Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Sen. Res. M.O. At rate of £125.

Manchester Ear Hospital, Grosvenor-square, All Saints.—Non-Res. H.S. At rate of £150.

Manchester Royal Infirmary.—Surg. O. to Out-patients. £35. Also Clinical Pathologist. £156.

Manor House Hospital, Golders Green.—H.S. £200.

Margate and District New General Hospital.—Res. M.O. £125.

Middlesbrough County Borough Fever Hospital.—Asst. Res. M.O. £450.

Mitcham, Wilson Cottage Hospital.—Hon. Consulting S. and Hon. Consulting P. to Ear, Nose, and Throat Dept.

Mount Vernon Hospital, Northwood, Middlesex.—Gynæcologist.

National Hospital, Queen-square, W.C.—Jun. Reg. £200. Also Asst. Phys.

Newark General Hospital.—Res. H.S. At rate of £150.

Newcastle-upon-Tyne General Hospital.—Radiologist. £300.

Norwich, Norfolk and Norwich Hospital.—H.S. £120.

Northampton, Mental Hospital, Berrywood.—Locum Tenens M.O. 7 gns. per week.

Nottingham General Hospital.—2nd Cas. O. At rate of £150.

Oldham Royal Infirmary.—H.S. At rate of £175.

Portsmouth Royal Hospital.—Cas. O. At rate of £100.

Pretoria Onderstepoort Veterinary Research Laboratory.—Three Research Fellowships. £800–£1000.

Queen's Hospital for Children, Hackney-road, E.—Res. M.O. At rate of £200. Also Asst. Physician.

Rhondda Urban District Council.—Asst. M.O.H., &c. £500.

Rotherham Hospital.—Sen. H.S. £200. Also H.P. £180.

Royal Free Hospital, Gray's Inn-road, W.C.—Asst. M.O. for Female V.D. Clinic. At rate of £350. Clin. Assistantships to Special Depts. Also Res. Anæsthetist to the Gyn. and Obstet. Unit. £150.

St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—Hon. Clin. Assts.

St. Thomas's Hospital, S.E.—Physician. Physician to Out-patients' Dept. Also Asst. Dental S.

Salford Royal Hospital.—H.P., and H.S.'s. Also Cas. H.S. All at rate of £125.

Sheffield Children's Hospital.—3rd Res. M.O. £100.

Sheffield Royal Hospital.—Res. Anæsthetist. At rate of £80.

Sheffield Royal Infirmary.—H.S. £80.

South London Hospital for Women, South Side, Clapham Common, S.W.—Two H.S.'s. Each at rate of £50.

South Shields, Ingham Infirmary.—Sen. and Jun. H.S.'s. £200 and £150 respectively.

Southampton Borough Hospital.—Res. M.O. £275.

Southampton, Royal South Hants and Southampton Hospital.—Sen. H.S. £225. Also Asst. H.S. £180.

Swansea County Borough.—Asst. M.O. £600.

Truro, Royal Cornwall Infirmary.—H.S. £170.

University of London.—Laura de Saliceto Studentship. £150.

Walsall, General Hospital.—Cas. H.S. At rate of £120.

Western Dispensary, Rochester Row, Westminster, S.W.—Res. M.O. and Dispenser. £150.

West African Medical Staff.—M.O.'s. Each £660.

West London Hospital, Hammersmith, W.—H.S., Aural and Ophth. H.S. Also Res. Asst. Cas. O. Each at rate of £100.

Weymouth and District Hospital.—H.S. £180.

Whipps Cross Hospital, Whipps Cross-road, Leytonstone, E.—Con. Oph. Surg. One afternoon fortnightly. £100.

Wigan Royal Infirmary.—Res. Med. and Surg. O. and Reg. £250. Also Two H.S.'s. Each at rate of £150.

Willesden General Hospital, N.W.—Clin. Asst. to Surg. Out-patient Dept.

Winchester, Royal Hampshire County Hospital.—Sen. Res. M.O. £200. Also H.P. and H.S. Each £150.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Sittingbourne (Kent), and Bruton (Somerset).

The Secretary of State for the Home Department gives notice of a vacancy under the Workmen's Compensation Act for the Districts of the Caernarvon and Pwllheli County Courts (Circuit 29). Applications should be reach the Private Secretary, Home Office, Whitehall, London, not later than 21st June, 1930.

Births, Marriages, and Deaths.

BIRTHS.

BUIST.—On May 30th, at Dundee, the wife of Major T. P. Buist, R.A.M.C., of a son.

COOKE.—On May 29th, 1930, at the Stoneboro Nursing Home, to Betty, wife of Robert V. Cooke, F.R.C.S., 9, The Green, Llandaff—a son.

COTTER.—On May 22nd, the wife of Major E. Cotter, I.M.S., Eglantine, Cork, of a son.

HANSON.—On May 23rd, at Welbeck-street, the wife of David C. Hanson, M.C., M.B., New King's-road, Hurlingham, S.W., of a daughter.

HAWARD.—On May 22nd, at a nursing home, the wife of Dr. F. C. Haward, of a daughter.

SABONADIERE.—On May 25th, at Harvey House, Watton, Norfolk, the wife of R. W. Sabonadiere, M.R.C.S., L.R.C.P., of a daughter.

MARRIAGES.

DAVIES—FANING.—On May 24th, at Holy Trinity Church, Exmouth, D. S. Davies, M.D., to Mary, widow of the Rev. J. F. E. Faning, M.A.

GREENWOOD—JONES.—On May 31st, at Maze Hill Congregational Church, Greenwich, Eric John Greenwood, M.B., B.Ch., to Dorothy Helen Jones, elder daughter of Mr. and Mrs. W. G. Jones, of Greenwich.

DEATHS.

BROCK.—On June 1st, 1930, at Bloemfontein, O.F.S., South Africa, Benjamin George Brock, L.R.C.P. & S., D.P.H.Edin., aged 76 years.

CAMPBELL.—On May 26th, at Beech-hill-road, Eltham Park, London, Dr. Susan Campbell, of Ajmer, India.

GASTER.—On May 31st, at Devonshire-place, Anghel Gaster, M.D., M.R.C.P. Lond., aged 66.

JOHNSTON.—On June 1st, at a nursing home in Edinburgh, Robert McKenzie Johnston, M.D., F.R.C.S.E., of Lansdowne-crescent, Edinburgh.

MACLEOD.—On May 30th, at Craven-hill, W., Herbert William George Macleod, M.D., B.Sc., M.R.C.P. Lond., Barrister-at-Law, late Captain I.M.S., aged 69 years.

SANDALL.—On May 31st, at Springfield, Montalt-road, Woodford Green, Colonel Thomas Edward Sandall, C.M.G., T.D., M.D. Camb.

WINTER.—On May 28th, at Holne Brake, West Malvern, Dr. George Mitchell Winter, O.B.E., J.P., late of St. Marychurch, Torquay.

*N.B.—A fee of 7*s.* 6*d.* is charged for the insertion of Notices of Births, Marriages and Deaths.*

Notes, Comments, and Abstracts.

INFANT WELFARE WORK IN HOLLAND.

THE town council of Amsterdam undertook the work of municipal infant welfare in 1920, at a time when the Society for Infant Welfare felt unable to carry on the task. It was thought that this work offered remarkable opportunities not only for the prevention of disease and the reduction of infant mortality, but as a means of raising the cultural level of the population. The young mother with her first baby is faced with so serious a responsibility that she is peculiarly ready to accept advice, and the rules of hygiene instilled at a welfare centre will stand her in good stead in subsequent pregnancies. The report of the Municipal Health Service of Amsterdam for the five years between 1922 and 1926 records a steady increase in the number of centres, and mentions that 72 infant welfare conferences are now held weekly in various parts of the city. The staff of each welfare division consists of a chief, or leader, who is a full time officer, and of medical officers who do part-time work at the centres. Each centre has, in addition, a full time trained nurse, and 18 partly trained women, called kraamverzorgsters are attached to each division. The municipal midwives carry out their antenatal work in the building containing the welfare centre, and create a link between the expectant mothers and the welfare workers. Propaganda visits are made to young mothers and pregnant women, but if it is learned in any case that the family doctor has undertaken the care of the child, the clinic does not attempt to interfere further. Sick children are not treated at the centres, but the mothers are advised to go at once to their own doctors. At present the work of the clinic ends when the child passes its first birthday, but it is hoped that supervision will shortly be extended up to three years, when the child passes into the hands of the school doctor.

Statistics collected over the five years show that the average duration of supervision at the centre for each child increased from 21 weeks in 1922 to 29 weeks in 1926; in other words, the interest of the mothers is becoming more persistent as the value of the clinics becomes more widely appreciated. The number of children attending the centres, moreover, had increased from 4873, or 34·1 per cent. of live-born children in 1922, to 6357, or 46·7 per cent., of live-born children in 1926. Some interesting statistics have been compiled on infant feeding from information supplied by the various centres, and it is even possible to compare the results at individual centres by an analysis of these statistics. On the whole, almost three-fifths of the children attending the centres are breast-fed, at any rate for the first three months of life. One-fifth of infants are partially breast-fed, and the remainder are artificially fed, or the feeding is unknown. It is found that the proportion of breast-fed infants varies very little from year to year. It is yet too early to draw conclusions, but there is some evidence that the infant mortality-rate under one month is considerably lower among children attending the centres than among the general population.

RHEUMATISM IN CHILDHOOD.

IN his annual report on the St. Marylebone Children's Rheumatism Supervisory Centre for 1929, Dr. J. F. Halls Dally, the medical director, says that at this centre such therapeutic measures as may be found necessary are subsidiary to an inquiry into the nature of the constitution of rheumatic children. "Recent findings," he says, "tend to confirm previous conclusions that the rheumatic constitution can be detected by biochemical means. The most common abnormality of chemical constitution of the 'rheumatic soil' is faulty metabolism of calcium, phosphorus, magnesium, and sulphur. Corresponding with different clinical types which manifest different rheumatic symptoms, two biochemical groups can be differentiated. One group presents either no deviation of the acid-base equilibrium of the body, or a slight deviation to the alkaline side; this group does not, as a rule, suffer from cardiac rheumatism. The second group shows a deviation of the acid-base equilibrium to the acid side, and so far there has been no exception to the rule that cases of cardiac rheumatism fall into this latter class. It is significant that a very large proportion of all children investigated up to date yields no evidence whatsoever of any acute or chronic infective process. It would thus seem that most of the subjective symptoms can be accounted for by metabolic abnormalities alone."

Dr. Halls Dally says that an attempt is being made to interpret both clinical and biochemical findings in terms of endocrine function. The work of the centre is, in this way, being correlated with recent developments in research elsewhere, which, he believes, point to lack of balance or inadequacy of the glands of internal secretion as one of the primary causes of rheumatism.

SMOKE AND HEALTH.

THE joint committee of the Manchester and District Regional Smoke Abatement Committee and of the National Smoke Abatement Society have done well to include in their propaganda the lecture recently delivered at the College of Technology by Dr. J. S. Taylor, assistant medical officer of health for Manchester. Dr. Taylor deals with the subject in a clear and convincing manner. Charts illustrate the effect of fogs in Manchester in causing an increase in the deaths from respiratory diseases. The excess in infant and young child mortality in the towns, when compared with the country and in the northern industrial towns as compared with the southern towns, is shown in tabular form, and reasons are adduced to support the view that a smoky and dusty atmosphere is a prime cause in producing this relative excess. We have often called attention to the greater mortality from respiratory diseases in dirty-aired as compared with clean-aired towns, a greater mortality which falls especially on the young children. Dr. Taylor deals adequately with the biological action of light and the facts and references in the pamphlet should prove of value in arousing a demand among town-dwellers for a purer atmosphere in which to live.

The pamphlet (price 2*d.*) can be obtained from the office of the Societies, Civic Buildings, 1, Mount-street, Manchester.

HINDU MEDICAL TREATMENT.

THIS little book[1] is founded, as the author, Miss Dorothea Chaplin states, on the verbal and written teaching of the late Mr. S. M. Mitra, a lawyer and well-known publicist, whose views on many international and social questions found expressions at congresses and in the columns of the press. He became a psychotherapist, and in that capacity wrote a volume for the use of neurasthenic members of the public who consulted him, and in this he dealt specially with the treatment of nervous disorders by Hindu remedies. The Hindu practice, it appears, includes a form of psycho-analysis, in which specially prepared tales are read to the patient after which questions are asked which are calculated to elicit the various mental symptoms. These notes on Hindu medical treatment are too disjointed to give a coherent idea of what is being aimed at or what definite results have been obtained.

BRISTOL HOMŒOPATHIC HOSPITAL.

THIS institution, which last year received nearly 1000 in-patients, and treated 1695 out-patients, had a deficit of £3369 on its ordinary expenditure. The President, Mr. Melville Wills, has given £5000 to reduce the bank overdraft and £20,000 to the endowment fund. The work of the hospital, which has now been recognised as a training school for nurses, has so greatly increased that it is rapidly becoming impossible to carry it on in the present premises.

ABSINTHE DRINKING IN ENGLAND.

WE have received from Messrs. Gancia and Co., Ltd., Canelli, Italy, who are among the largest producers of vermouth, a letter traversing some of the facts contained in an article published in THE LANCET of April 26th under this heading. The Italian firm protest against the implication that the absinthe in vermouth forms an introduction to absinthe-drinking in England through the medium of cocktails. They write:—"We will at once confess that our brand of vermouth *does* contain the essential oil of absinthe, but to the negligible extent of three milligrammes of absinthol to one litre vermouth or, expressed in 'plain English,' about one 350,000th part by weight or volume. Why such a small proportion? Because we too know that many stimulants, taken in excess, are harmful, and because vermouth does not depend on any one herb for its special taste and aroma, but on prolonged maceration of many different plants in fortified wine. We believe that vermouths of other makes would also show much the same results, if analysed. We submit that such a small amount of absinthe in vermouth cannot be considered injurious; quite on the other hand, these few milligrammes form a valuable stimulant, besides improving the taste of the vermouth. However, should the British public, acting on Dr. Brasher's advice, disapprove of the presence of absinthe in vermouth at all, then we are quite prepared to eliminate it from our brand altogether, substituting other herbs which will give much the same effect without possessing the lethal properties which your doctor fears so much. We are afraid that the absinthe question in England has been confounded with the pure 70 per cent.

[1] Some Aspects of Hindu Medical Treatment. By Dorothea Chaplin. London: Luzac and Co. Pp. 71. 3*s.* 6*d.*

alcohol absinthe which was once upon a time allowed in France. We agree with Dr. Brasher that this beverage is injurious, unless drunk in exceedingly small quantities. What is required is moderation in these things. We scarcely think that the author of the article in question eschews tea and coffee completely, simply because they are injurious to the human system when drunk in excess, or that he refuses to ride in a motor-car because it is possible to drive it too fast!"

A CELEBRATED MEDIUM.

THE investigations into the phenomena produced in this country by Mrs. Piper, the American medium, are to be found in the Proceedings of the Society for Psychical Research, but those who are interested in the abnormal mental states known as mediumship will welcome an account of the life of this medium as recorded by her daughter.[1] The father and mother of Mrs. Piper were of English ancestry, deeply religious, and "strong, healthy, normal people," while the medium herself, the fourth of six children, seems to have heard voices and seen visions as early as her eighth year. Subsequently, Mrs. Piper further developed her unusual psychic qualities. After her mediumship had been investigated in America by Prof. William James of Harvard, and others, she was the subject of inquiry by the Society for Psychical Research in this country, and the book describes these investigations besides giving some account of the medium's home life. The volume is illustrated with reproductions of portraits of Mrs. Piper at various ages and of William James, F. W. H. Myers, Richard Hodgson, and Sir Oliver Lodge, as well as with specimens of automatic writing.

"BANTAM" COFFEE.

THERE is much waste in the making of coffee in the ordinary way, while the care necessary for properly preparing it takes up much time. These things are designed to be obviated by the use of "Bantam" coffee, a sample of which has been sent to us by the Bantam Products, Ltd., of Wortley, Leeds, with London offices at 9, Queen Victoria-street, E.C. 4. This consists of a brown granular powder which contains the soluble portion of the coffee bean. The powder can be completely dissolved in hot water, in cold water more slowly, and as there are no "grounds" left the beverage may be drunk to the last drop. It can be made in the cup at the table, or for large parties in an urn. The product should not be classed with "coffee essences," for on the palate it has the flavour of freshly roasted coffee prepared in the usual manner. If protected from moistu e it is claimed that the powder will remain unchanged for a long time, and certainly the preparation is economical in use.

THE DOCTOR'S JOB.

THIS small book[2] is introduced to medical readers in a few words by Sir Donald MacAlister, who commends it to the careful perusal of medical students. Undoubtedly every medical student will be better "qualified" for his profession if he his able to look at the general problems of social life in the clear manner that Dr. Lloyd-Williams employs for their elucidation. A chapter on the problems of medical practice is added for the consideration of the qualified, where the remarks on birth control are thoughtful

CABBAGES.

Mr. A. W. Hill, F.R.S., Director of Kew Gardens, who delivered a Chadwick lecture in the open air at the Chelsea Physic Garden on May 29th, said that the original cabbage was supposed to have arisen from the tears of Lycurgus whom Dionysus had bound to a vine; botanically every cabbage was descended from the indigenous *Brassica oleracea*, now to be seen covering the cliffs at Dover. It was a plant with a stem, leaves and many racemes, which men had altered to suit their own needs. The stem is developed in kohl-rabi (*caulis*, cole, kale, the stalk). The leaves had been grown into heads in the spring cabbage, in the curly savoy, in the red cabbage (which should never be pickled, but cut in slices and stewed in its own juice), and in the thousand-leaved kale grown for the winter food of sheep. The axillary buds become Brussels sprouts, which are anatomically bulbs. The inflorescence had been developed in the broccoli or cauliflower. No other plant has had so much advantage taken of its opportunities. Theophrastus mentions three kinds, Pliny six, de Candole (1834) 30; now there are a hundred kinds.

[1] The Life and Work of Mrs. Piper. By Alta L. Piper. With an introduction by Sir Oliver Lodge. F.R.S., D.Sc. London: Kegan Paul, Trench, Trübner and Co., Ltd., 1929. Pp. 204. 7s.6d.

[2] The Doctor's Job. By A. Lloyd-Williams, M.B., B.S. Lond., M.R.C.S. Eng., L.R.C.P. Lond. Student Christian Movement Press. 1930. Pp. 72. 2s.

A STOKER'S LOG.

GENERALLY when people talk about ventilation on board ships it is to complain of draughts. It is the more satisfactory to learn from the account given by Mr. H. Vincent[1] of his time as a stoker in the Navy in the war, that when he moved from an old cruiser to the new flagship of the Harwich force, he found the new ventilation a comfort, fresh air being driven into every compartment, however small. As a stoker in the tropics he was never ill; on the contrary, he was always in good condition, and hungry for the hot and greasy dishes he had in his mess. He never heard a word against the quality of the "pusser's" provisions, though they would have been better without cockroaches. He drank water freely when "on the fires," and against advice, but never suffered from cramps; but then he does not tell us what quantity of salt he took in his mess. Stokers are, he thinks, the hardest working men in the ship, very kind to one another, even to the author when he had just joined. The worst crime in this branch of the service is to let the fire out; the next bad, to admit an allotted job too hard, or to look exhausted. The night runs from Harwich were made in constant anxiety, and it was at such times leave was most welcome, though at all times a luxury to men off a crowded, severely conditioned lower deck. This book contains many good and dramatic stories, and some excellent silhouettes.

HOSPITAL AND AUXILIARY SERVICES AT LIVERPOOL.

THE Merseyside Hospitals Council has issued a handy little "Guide to Hospital and Auxiliary Services" within the scope of that body. These services are many and of great variety, ranging from convalescent treatment and the loan of invalid furniture to the follow-up of out-patients and home nursing. The booklet forms an admirable conspectus of the auxiliary services which are being developed rapidly by this enterprising council. It should be of real and suggestive value to the similar organisations which are springing up all over the country.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 24TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 304 (last week 324); scarlet fever, 1887; diphtheria, 1167; enteric fever, 69; pneumonia, 1034; puerperal fever, 44; puerperal pyrexia, 103; cerebro-spinal fever, 15; acute poliomyelitis, 2; acute polio-encephalitis, 1; encephalitis lethargica, 10; dysentery, 2; ophthalmia neonatorum, 115. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the infectious hospitals of the London County Council on May 27th–28th was as follows: Small-pox, 462 under treatment, 13 under observation (last week 513 and 22 respectively); scarlet fever, 2036; diphtheria, 2376; enteric fever, 29; measles, 797; whooping-cough, 68; puerperal fever, 21 (plus 13 babies); encephalitis lethargica, 121; poliomyelitis, 1; "other diseases," 19. At St. Margaret's Hospital there were 17 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London there was no death from small-pox, 1 (0), from enteric fever, 45 (16) from measles, 6 (2) from scarlet fever, 28 (1) from whooping-cough, 29 (6) from diphtheria, 42 (12) from diarrhœa and enteritis under two years, and 39 (6) from influenza. The figures in parentheses are those for London itself.

The fatal case of enteric fever outside London occurred at Ilford. Deaths from measles are rapidly sinking, the highest figures being Liverpool, 4; Manchester and Salford, each 3 (Edinburgh has 8). Four deaths from whooping-cough are reported from Birmingham, and 3 from diphtheria. Liverpool is credited with 7 deaths from diarrhœa; Manchester with 5.

The number of stillbirths notified during the week was 287 (corresponding to a rate of 40 per 1000 births), including 57 in London.

[1] A Stoker's Log. By H. Vincent. London: Jarrolds Pp. 256. 6s.

Lettsomian Lectures

ON

ENLARGED PROSTATE AND PROSTATECTOMY.

Delivered before the Medical Society of London

BY SIR JOHN THOMSON-WALKER, O.B.E., M.B. EDIN., F.R.C.S. ENG.,

CONSULTING UROLOGIST TO KING'S COLLEGE HOSPITAL; SURGEON TO ST. PETER'S HOSPITAL.

LECTURE III.*—THE OPERATION OF SUPRAPUBIC PROSTATECTOMY.

(Delivered on March 5th.)

THE operations for the removal of the enlarged prostate are divided into those performed by the perineal route and those, following McGill, by the suprapubic route. At the present time, largely as the result of Freyer's advocacy, the suprapubic route is almost universally practised. The popularity of the suprapubic route depends upon the ease of approach and the readiness with which the enlarged prostate can be shelled out by the finger. All enlarged prostates can be removed by the suprapubic route, and it is generally believed that the late results of the operation are better than those of the perineal operation. Space does not permit of a full discussion of the merits of the two operations. Only suprapubic prostatectomy will be described. Two types of procedure are at present in use, a closed operation which has been called Freyer's method [1] and an open operation that has been practised by Judd [2] and myself.[3]

Freyer's Method of Suprapubic Prostatectomy.—The bladder is approached and opened by a suprapubic incision two and a half inches in length. The forefinger of one hand is introduced into the rectum and pushes up the prostate. The forefinger of the other hand is introduced into the bladder, ruptures the mucous membrane covering the intravesical portion, and—keeping in close contact with the capsule—enucleates first one and then the other lateral lobe. The urethra is torn across and the prostate removed. The surfaces at the neck of the bladder are pressed together, between the finger in the rectum and that in the bladder in order to reduce bleeding. The bladder is irrigated with hot boric lotion (110° F.) through the catheter. A stout drainage-tube with two lateral eyes at the vesical end is placed in the bladder. The edges of the parietal wound are brought together and the tube kept in place by silkworm-gut sutures. The catheter is removed, and a voluminous dressing of gauze and wool applied. The bladder is irrigated twice daily with antiseptic lotion. The tube is replaced by a smaller one on the fourth day, and this is retained for a few days longer. When the wound has contracted to a small size a catheter is passed along the urethra and the bladder washed out through this.

OPEN PROSTATECTOMY.

Judd's Method.—The patient is placed in the Trendelenburg position, the bladder opened by a suprapubic incision, and self-acting retractors introduced. The prostate is then dissected out by forceps and scissors. A catgut stitch is placed on any bleeding vessel, and if necessary the cavity is packed. Drainage is either by catheter (and the bladder closed), or by suprapubic tube.

Thomson-Walker's Open Method.—The aim of this method is to avoid sepsis, to control bleeding, and to prevent post-operative obstruction. A median suprapubic incision, five inches long, is made, and the bladder is opened. The forefinger of the right hand is introduced into the bladder, the whole hand sinking between the recti muscles so that the hand moves freely. Enucleation commences by rupturing the mucous membrane at the posterior lip of the internal meatus, or on the far side of a projecting lobe. The finger separates the upper part of the lobes and easily finds the line of cleavage. After enucleation of each lobe, assisted by the longer second finger, the anterior commissure is separated from above downwards, the urethra severed on the catheter, and the prostate removed. No finger has been placed in the rectum. A catgut sling is placed in each lip of the bladder wound and the patient is raised into the Trendelenburg position. My self-retaining retractors are introduced, the catgut sling being twisted round the wings of the flynut on each arm. The blades are separated and the wound in the bladder extended so as to allow of free separation. The bladder base is freely exposed, clots are removed from it and the prostatic cavity, and a careful inspection is made.

There is usually some hæmorrhage and sometimes spouting vessels are seen. Arterial bleeding comes almost invariably from an artery lying below the torn mucous membrane at the outlet of the bladder about the mid-coronal line. Venous bleeding comes from the lateral or anterior walls of the prostatic cavity. Long artery forceps are placed on the bleeding points. With a short, strong, fully curved needle on a special holder, a catgut ligature is passed round the bleeding point and tied. There is usually no difficulty in this, but sometimes in the deeper part of the prostatic cavity it may not be easy. A continuous hæmostatic suture is introduced in most cases. This serves the double purpose of controlling bleeding and of forming a smooth edge which heals evenly at the vesico-prostatic outlet. The suture commences just in front of the mid-coronal line on the far side, and passes round the posterior two-thirds of the circumference of the opening. The stitch includes the mucous membrane, the edge of the bladder sphincter, and sometimes, at the lateral aspect of the opening, the edge of a thin layer of the false capsule of the prostate. If the bladder is contracted and deep, and there is urgent necessity for saving time, the stitch may be omitted, but it is very useful and greatly reduces the danger of hæmorrhage.

If venous bleeding persists, in spite of temporary plugging with a swab, and there is no single point readily accessible, the prostatic cavity should be packed. For this, the catheter is drawn well into the bladder, and a strip of iodoform gauze is packed round it.

Having controlled the bleeding, and before introducing the hæmostatic suture or packing, a search is made for tags, flaps, or nodules of prostatic tissue. A large variety of these may be discovered and dissected away. Loose flaps of mucous membrane at the sides of the vesico-prostatic opening are dissected away, and nodules of prostatic tissue may also be removed. A prominent semilunar ledge forms the posterior lip of the opening, which it tends to narrow. It is picked up in the middle line and a wedge cut out of it. This enlarges the vesico-prostatic opening, and prevents post-operative contraction.

Having completed the arrest of hæmorrhage, the clearing of the prostatic cavity and the opening-up of the vesico-prostatic opening, repair of the bladder and abdominal wall is undertaken. A large rubber tube is placed in the bladder and the blades of the retractor changed. The blades are inserted in the pubic end of the wound and separated, and the anterior surface of the bladder wall and the space of Retzius are fully exposed. The bladder is pulled up by the catgut slings and the bladder wound closed up to the tube by a continuous catgut suture. If the prostatic cavity has been packed with gauze, a corrugated rubber strip is placed between this and the bladder wall in front of the tube. A small tube is placed in the prevesical space. Two catgut mattress sutures are placed through the recti muscles and sheaths about an inch from the edge of the wound and the same distance apart. The rectus

* Lectures I. and II. appeared in our issues of May 31st and June 7th, respectively.

sheath is united with a continuous suture of fine catgut and the mattress sutures are tied The skin wound is closed to the tubes with interrupted silk-worm-gut sutures. A many-eyed catheter is tied in the urethra with the tip in the bladder. This is closed with a spigot, and the end of the catheter and the penis are enveloped in an antiseptic dressing.

Routine Post-operative Treatment.—The treatment of cases of prostatectomy from the time of the operation to the closure of the bladder is of vital importance. Failure in the conduct of cases during this stage accounts for a large percentage of the mortality and also for imperfect late results. The following is the routine that is carried out in cases under my care.

Immediately after the operation the foot of the bed is raised 18 inches, and the patient is carefully watched for shock. If he is restless, a quarter of a grain of morphia is given hypodermically and this may be repeated at night if necessary. At the operation a dressing of gauze and wool is applied, and this is usually allowed to remain overnight, or is reapplied. Hæmorrhage is the danger at this stage. An increasing pulse-rate, uncontrollable bladder spasm from clot, restlessness, and blanching are all important signs, and should lead to careful inspection. If bleeding is so severe as to produce large clots, or the general effect of hæmorrhage is apparent and the blood is bright, the prostatic cavity will have to be packed. This is best carried out under a short anæsthesia; gas and oxygen is not suitable as it increases the bleeding. The tubes are taken out, clots are rapidly removed from the bladder with sponge forceps, and a full stream of weak nitrate of silver solution (1 in 20,000) is passed through the catheter. The end of the catheter is now drawn well into the bladder. The prostatic cavity is packed with iodoform gauze, the finger of the right hand being in the bladder and packing the strips of gauze snugly round the catheter. The large bladder tube and the prevesical tube are replaced. If the patient has not already had morphia he is given a hypodermic of a quarter of a grain, and the foot of the bed is well raised.

When no such accident has occurred the usual routine is carried out. The gauze and wool dressing is replaced on the morning after the operation by a Hamilton Irving suprapubic box, and the bed is returned to the horizontal. Either intermittent daily irrigation or continuous irrigation is arranged. The majority of my cases are placed on continuous irrigation, which is maintained for four or five days or even longer. An irrigation rubber bag, or better a thermos, is hung 3 feet above the level of the patient. Interrupting the rubber tube leading from this is a glass dropper. The tube passes over a rubber hot bottle, and is connected with the catheter in the urethra. The tubes of the Hamilton Irving suprapubic apparatus are carried under the thighs to a pail under the bed. The fluid (silver nitrate solution 1 in 20,000) runs at a rapid drip. In the cavity of the suprapubic box is placed a gauze bag of coarse crystals of boric acid, which is replaced every 12 or 24 hours. On the third day after the operation a dose of castor oil is given. Enemata are forbidden, as they are liable to cause hæmorrhage. If the prostatic cavity has been packed the packing should be very carefully removed after 24 or 48 hours. This is assisted by a stream of fluid through the catheter, and constant irrigation is installed at once after the removal. The tubes are removed on the fourth or fifth day, but not before. A small tube replaces the large bladder tube for two days, and is then removed. Continuous irrigation may be maintained for another day or two, or omitted.

Each day the box is removed, cleaned, boiled, and replaced. A suitable ointment containing an antiseptic is smeared on the skin so that the box does not irritate it. Care and frequent inspection are required on the part of the nurse to adjust the box. At the daily dressing a full flow of fluid is passed through the catheter and tube, and all clots are removed. Care must be taken not to raise the pressure in the bladder by too great a flush, otherwise hæmorrhage may be started. If during the time the tubes are in the wound the urine becomes brightly blood-stained or a dark, venous oozing persists, constant irrigation with weak silver solution is installed at once, an injection of morphia is given, and the patient kept quiet. If the oozing persists, an injection of hæmoplastin should be given each night and morning for two days and calcium lactate by mouth in doses of ten grains every four hours for 48 hours. If at the end of this time the bleeding has not ceased or is not diminishing, the prostatic cavity should be packed. Hæmorrhage sometimes occurs about the tenth or twelfth day, when the bladder is beginning to be stretched by contraction on closure of the wound or where it has been over-distended by irrigation. If the bleeding appears to be serious, the suprapubic wound should at once be opened up, and a tube introduced and a catheter placed in the urethra and continuous irrigation installed. If the hæmorrhage persists in spite of this and other measures already enumerated, the prostatic cavity should be packed round an indwelling catheter.

In the usual routine the catheter is removed on the seventh day. During the time the catheter is in the urethra the most stringent precautions must be taken to prevent infection spreading up alongside it or along the column of urine in its lumen. A dressing of glycerin on iodoform gauze is placed round the glans penis, and when the catheter is not in use for irrigation it is closed with a sterile plug and the end covered with an antiseptic dressing. Washing the bladder by Janet's method of hydrostatic irrigation through the urethra and the forcible distension of the bladder to the point of micturition by the nozzle of an irrigating apparatus in an almost-closed suprapubic fistula are methods that are better avoided, as they promote bleeding. Hæmorrhage at the time of the operation and during the convalescence from prostatectomy requires prompt and skilful treatment. The patient operated on for removal of the prostate should leave the operating theatre as dry as he would in any other operation. Continued leakage of dark venous blood should be looked upon as a matter of serious import demanding energetic measures for its control. The appearance of bright blood in the urine, especially when accompanied by clotting, should be regarded as a matter of grave danger. The hæmostatic bag of Hagner or Pilcher is used by some surgeons. It is a rubber bag attached to a catheter and distended with air to press on the walls of the prostatic cavity. The bag is held in position by traction on the catheter. I do not use this method as I have found the means of controlling hæmorrhage already described amply sufficient if applied in proper time.

Two-stage Prostatectomy.

Prostatectomy as a secondary operation is a different operation from primary prostatectomy. The bladder is open and infected and it is adherent to the abdominal wall and the posterior surface of the pubic symphysis. The cavity is reduced to a small space, and the walls are thick and rigid. The abdominal wall in the suprapubic region is infiltrated with inflammatory material and is rigid. Under such conditions open prostatectomy in the manner I have described is not a satisfactory operation. In order to perform the open operation the matted inflammatory tissue and the scar tissue must be dissected away, the bladder freed from the abdominal wall and pubic bones, and the scar tissue in the bladder wall surrounding the fistula excised. This mobilisation of the bladder must take place before the enucleation begins. The contracted bladder renders exposure of the prostatic cavity far from perfect. This is a formidable addition to the ordinary open operation, and is, I believe, too severe for the majority of cases submitted to secondary prostatectomy. There are some cases where months have elapsed since the preliminary cystotomy where the scar tissue is small in amount and the condition of the patient good. In these cases an open operation

may be performed. For the majority of cases of secondary prostatectomy the technique of Freyer is more suitable. With this also the operation is more severe than a primary prostatectomy, and the probability of obtaining a clean prostatic cavity and a rapidly closing firm wound is less.

Prostatectomy in the Fibrous Prostate.

In most cases of fibrous prostate enucleation by the closed method is a difficult and unsatisfactory operation, and may be impossible to complete. The ultimate results in the majority are highly unsatisfactory. The ragged walls left after tearing out the prostate promote sepsis, and post-operative contraction of the vesico-prostatic outlet is a likely sequel. It has been suggested that these cases should be operated by the perineal route. It must be remembered that in many cases the adherent nature of the prostate is not discovered until the operation has commenced, and occasionally only when the prostate is partly enucleated. To abandon the operation and resort to a perineal dissection is a highly unsatisfactory procedure. I have found no difficulty in dissecting these prostates by the open suprapubic method. If difficulty is encountered in enucleating the prostate the patient is at once placed in the Trendelenburg position and the operation performed by dissection.

Where the adherent nature of the prostate is discovered before enucleation has been commenced the Trendelenburg position is assumed at once, and the bladder base exposed. The mucous membrane round the internal meatus is incised with curved scissors and the incision deepened. The upper part of the prostate, as it begins to appear, is grasped with forceps and gently raised while the clipping with scissors proceeds, the blades being kept rigidly to the surface of the gland. The lobes are dissected equally and some blunt dissection with the closed scissors or the forefinger may help. The anterior commissure is separated from above downwards, and the urethra cut across. A clean, roomy cavity with smooth walls can thus be obtained. There is more tendency to bleeding after the dissection than after enucleation, and I usually pack the prostatic cavity as well as introducing a hæmostatic suture.

Surgical Accidents and Complications of Prostatectomy.

The causes of death in 269 cases of suprapubic prostatectomy for simple enlargement of the prostate at St. Peter's Hospital are stated in the following table, and give a general idea of the dangers that attend the operation.

Table showing Causes of Death after Suprapubic Prostatectomy in 269 Fatal Cases at St. Peter's Hospital from 1901 to 1929.

		Total number and Percentage.
Surgical accidents:		
Shock	25	64 (23·4)
Cardiac failure	32	
Hæmorrhage	7	
Renal failure:		
Uræmia	67	67 (24·0)
Septic complications:		
Pyelonephritis	53	63 (23·4)
Pelvic cellulitis	3	
Septicæmia	7	
Diseases of the lungs:		
Pneumonia	23	28 (10·4)
Bronchitis	5	
Diseases of the circulation:		
Cerebral hæmorrhage	4	26 (9·6)
Coronary thrombosis	1	
Venous thrombosis	1	
Pulmonary embolism	20	
Diseases of the bowel:		
Acute dilatation of the stomach	1	3 (1·1)
Ileus of intestine	2	
Asthenia and general debility	10	10 (3·7)
Accidental complications:		
Acute mania	2	8 (2·9)
Influenza (epidemic)	4	
Pancreatitis	2	
	269	

It will be seen that over 70 per cent of fatal results are due to shock, renal failure, and sepsis. Hæmorrhage accounts for only a small number (2·6 per cent.) of deaths, but it is probably a contributory factor in other fatal cases, such as some of those from asthenia and general debility.

Shock and cardiac failure are the result of too severe an operation on an old or enfeebled patient. The most serious shock follows attempts to enucleate an adherent fibrous prostate, secondary prostatectomy with much rigidity of the abdominal wall, and the open operation where the surgeon is unpractised in bladder surgery and unsystematic in surgical technique. At St. Peter's Hospital the open method is the operation generally practised, and the mortality compares very favourably with other hospital figures. In each case the type of operation which is most suitable should be chosen, having regard to the condition of the patient and the ability and experience of the surgeon.

The avoidable causes of serious hæmorrhage after prostatectomy are numerous. They include the following:—

1. Insufficient precautions at the time of the operation.
2. Sepsis. The onset of an attack of cystitis from post-operative infection may be heralded by severe hæmorrhage. Late hæmorrhage (tenth to twelfth day) is seldom a real secondary hæmorrhage in the surgical sense.
3. Injudicious and unskilful passage of instruments along the urethra during the first week or ten days after the operation.
4. Over-distension of the urethra or bladder by attempts to wash the bladder by Janet's hydrostatic method or by forcing fluid into the bladder through a narrow suprapubic fistula.
5. Distension of the rectum by large enemata during the first week after operation.
6. Straining and undue exertion on the part of the patient.
7. Delay in treating a moderate hæmorrhage when it is commencing or when there is continuous oozing.

After the operation all patients should be encouraged to drink large quantities of fluid and especially the diuretic waters, such as Contrexéville and Vittel. If symptoms of uræmia appear (drowsiness, want of appetite, thirst, dry tongue) the diuretics should be pressed, and in addition fluid may be introduced by means of proctolysis or subcutaneous or intravenous infusion of saline solution with glucose. The prevention of septic complications begins at the operation and continues until the bladder is closed. In the open operation the rectal finger is banned, and all shreds and loose material likely to slough and become infected are carefully removed.

After the operation the following measures are adopted to prevent sepsis:—

1. The Hamilton Irving suprapubic box with a bag of boric acid crystals on the wound.
2. Continuous irrigation of the prostatic cavity and bladder with weak antiseptic solution through a catheter retained in the urethra.
3. Antiseptic dressing of the penis and catheter.
4. The routine use of urinary antiseptics such as cystazol, caprokol, and acriflavin.

Epididymitis is one of the most frequent complications of urinary infection, and many surgeons perform vasectomy at the time of the prostatectomy. I have not found this necessary, for epididymitis occurs only in a small number of my cases (6·4 per cent.), and is usually very mild.

The Merits of the Different Operations.

The closed, blind or Freyer method has the advantage of rapidity, which in some cases that require operation is a matter of importance. The question of rapidity must, of course, depend on the habits and skill of the surgeon, but other things being equal, it is the most rapid of the suprapubic operations. This method is, moreover, easy to perform and requires no special skill in bladder surgery. Once the surgeon has learned to find the line of cleavage he will succeed, in some measure at least, in removing the obstruction.

Its disadvantages are that sepsis is more likely to be a complication of convalescence than in some other methods, that hæmorrhage is blindly and often imperfectly controlled, and that post-operative

obstruction may be expected in a certain proportion of cases.

The open operation has the advantages that many of the causes of sepsis are removed, that hæmorrhage is more efficiently controlled, and that post-operative obstruction is guarded against.

The disadvantages of the open method are that it is more difficult and needs a knowledge of bladder surgery, notably the proper exposure of the bladder base and intravesical manipulation.

Practice and team work is necessary if the time taken is not to be unduly prolonged. My usual time for the operation from the incision to the last stitch is 18 minutes, and, if the hæmostatic stitch is omitted, 13 minutes. The longer time taken by a surgeon unaccustomed to bladder work is a serious disadvantage. Enucleation with the finger in the horizontal position before exposure of the bladder base has the advantages that the method is more rapid than dissection in the Trendelenburg position, and in my experience there is less hæmorrhage when the prostate is enucleated than when it is dissected. Enucleation has the further advantage that the time during which the patient is in the Trendelenburg position is shorter.

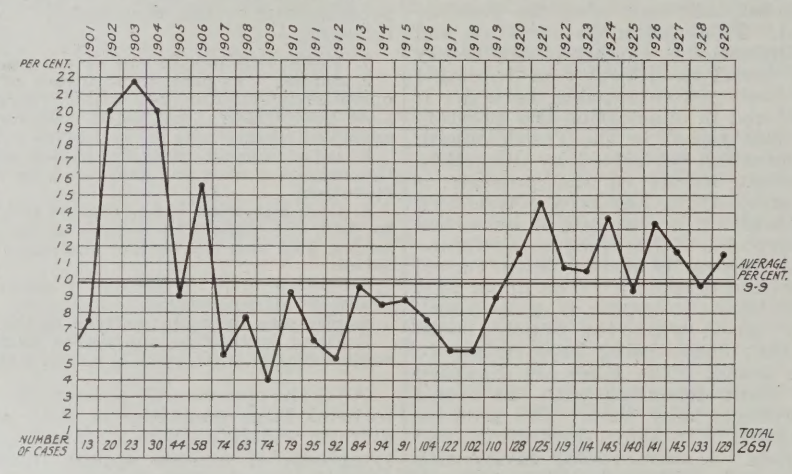


Chart of mortality of suprapubic prostatectomy at St. Peter's Hospital during 29 years.

RESULTS.

The results of suprapubic prostatectomy for simple enlargement of the prostate will be considered under two headings: mortality of the operation and failures.

Mortality.—In order to obtain a general view of the mortality of suprapubic prostatectomy, I found it necessary to collect statistics from various sources representative of the different conditions under which the operation is performed. In this country there is a sharp distinction between the arrangements that control the after-treatment of charity patients and what are called private patients. I have been fortunate in obtaining statistics from 11 of the great hospitals in different parts of the country for a period of ten years (1918 to 1928), and one for a period of seven years. I wish to express my cordial thanks to the members of the surgical staffs of these hospitals for the readiness with which they acceded to my request for information and the trouble taken to collect the statistics. I have arranged the statistics of the general hospitals in the accompanying Table, the hospital being designated by a letter and the number of beds in each hospital being indicated. The second group of statistics are those of St. Peter's Hospital, London, a hospital of 30 beds devoted entirely to surgical diseases of the urinary organs. The statistics of this hospital include all the operations of suprapubic prostatectomy from the first operation Sir Peter Freyer performed there in 1901 to the end of 1929. The third group of statistics which represent the statistics of private practice are my own cases. In order that the groups may be entirely distinct, I have excluded from my own figures all cases operated on in hospital.

In the general hospitals there were 3451 operations of suprapubic prostatectomy for simple enlargement of the prostate. Of these, 675 died, a mortality of 19·5 per cent. At St. Peter's Hospital there were altogether 2691 cases in a period of 29 years with 268 deaths, a mortality of 9·9 per cent. The fluctuation of the mortality from year to year is set out in the accompanying chart. In three of the years the mortality was below 5 per cent.—namely, 4 per cent. in 1909 and 4·9 per cent. in 1917 and 1918. In my private practice, during the 11 years 1919 to 1929 inclusive, I performed suprapubic prostatectomy on 472 patients with 25 deaths, a mortality of 5·2 per cent. The total number of my private cases was 608, with 37 deaths, a mortality of 6·08 per cent. There were series of cases of a year's duration in which the mortality fell to 1·7 per cent. (1921) and 2·1 per cent. (1923), and there were other series where the mortality rose to 9·7 (1927) and 11·4 (1920) per cent. The fallacy of considering a short period of time and a small number of cases is therefore obvious. It is, I think, the experience of all surgeons that a very considerable difference exists between the mortality of their private practice and that of their hospital work, and there is a further difference in mortality that becomes evident in the statistics that I have collected—namely, between the mortality of prostatectomy in the wards of a general hospital and that of a special hospital.

It is evident, therefore, that there is some factor outside the immediate control of the operating surgeon that produces so constant a difference in the mortality. The patients in private practice are on the whole better cared for and subjected to less physical strain, and are for the most part less exposed to the effects of unsuitable diet than are those of the hospital class. Hospital patients are, as a rule, submitted to operation at a later stage of the disease than private patients, and infection of the urinary tract is more frequently present before operation. Nevertheless, it cannot be denied that a very considerable proportion of cases operated on in private practice are grave surgical risks. A glance at the figures I have given in regard to circulatory risks is convincing of this. Moreover, the cases treated in a special hospital, taking them as a whole, are slightly greater surgical risks than those treated in a general hospital, for the reason that the cases that are considered hopeless elsewhere are usually referred to the special hospital.

So far as selection of cases for operation is concerned, I can vouch for the wide range of risks that are faced in the special hospital. If there is any criticism to make it is rather on the score of occasional recklessness than of over-caution in the sifting of cases for operation. In selecting cases we have been influenced by the fact that a working man who is refused prostatectomy is condemned either to catheter life or to suprapubic drainage, and that either of these alternatives implies certain misery and very grave risk; that, doubtless, is the general feeling among surgeons at the present time. The principal cause of the difference in statistics is, I think, to be found in the different conditions under which post-operative treatment is carried out in a general hospital, a special hospital, and in private practice. In a general hospital these patients are necessarily treated in large, freely ventilated surgical wards, and the post-operative treatment is mainly in the hands of the resident

surgeon, who as a rule is recently qualified and is replaced every six months. The private patients are accommodated in private hospitals or homes in separate rooms, heated to suit their special sensibility, and attended by special nurses accustomed to deal with these difficult cases; the post-operative treatment is carried out by the operating surgeon or his permanent assistant. Between these come the special hospitals, where the grouping of cases leads to special nursing measures and the post-operative treatment is in the hands of a resident surgeon of senior grade who has held several surgical appointments and been trained as a junior in the dangers which follow operation in these cases before he assumes the full responsibility.

The treatment after operation for prostatectomy is complicated, and its success depends on scrupulous attention to detail and on early and rapid action thinking that, if the belief in adequate preoperative examination and treatment were generally held, the time and accommodation would be forthcoming. It may well be that the adoption of a two-stage operation in some surgical centres is an attempt to meet this objection; as such it cannot be too highly commended. My own view is that the preparation in the average case is better carried out by careful catheter drainage and simultaneous general treatment. But if this cannot be efficiently carried out in the wards of a general hospital, the preliminary cystotomy of a two-stage operation is the best substitute, provided that adequate measures for the prevention of infection of the cystotomy wound and bladder be adopted.

Time might well be saved and the mortality lowered by the more detailed methods of prevention of sepsis after operation. It appears to be a fairly

HOSPITAL	BEDS	TOTAL OPERATIONS	TOTAL DEATHS	TOTAL DEATHS PER CENT.	ONE STAGE OPERATIONS	DEATHS ONE STAGE OPERATIONS	DEATHS % ONE STAGE OPERATIONS	TWO STAGE OPERATIONS	DEATHS TWO STAGE OPERATIONS	DEATHS % TWO STAGE OPERATIONS
A	668	425	95	22·3	252	55	18·8	173	40	23·1
B	336	157	32	20·3	102	16	15·6	55	16	29·0
C	250 ONE SERVICE ONLY	76	14	18·4	68	12	17·6	8	2	25·0
D	1006	1342	292	21·7	986	224	22·7	356	68	19·1
E	268	140	32	22·8	95	24	25·2	45	8	17·7
F	600 ONE SERVICE ONLY	58	10	17·2	40	8	20·0	18	2	11·1
G	572	448	57	12·7	154	23	14·9	294	34	11·5
H	275	128	21	16·4	77	12	15·9	51	9	17·6
I	366	157	36	22·9						
K	436	210	31	14·7	115	21	18·8	95	10	10·5
L	442	133	23	17·2	83	14	16·8	50	9	18·0
M	644	177 SEVEN YEARS ONLY	32	18·0	88	15	17·0	89	17	19·1
		3,451	675	19·5	2060	424	20·5	1,234	215	17·4

Table of mortality of suprapubic prostatectomy at 12 general hospitals.

where surgical accidents such as hæmorrhage occur. It cannot be expected that every newly qualified surgical officer will bring with him the knowledge and experience necessary for the successful conduct of these difficult cases. Some brilliant young men do come prepared, and it has been my pleasant experience to pass two years in the special department of King's College Hospital without a single death after prostatectomy. Further, Mr. Harold Edwards [4] has published the statistics of the Urological Department at King's College Hospital during five years (1922–26), which showed a mortality of 8·7 per cent. in 126 cases. But this is exceptional, and it is during the early months of learning that the mortality figures of the operation creep up.

There are two other points on which I write with some diffidence, for they relate to matters of surgical opinion rather than to the discussion of general management. I am not quite certain that sufficient attention is paid to the complete examination and careful preoperative treatment of these cases, and I do not think that the measures taken to combat post-operative sepsis and hæmorrhage are universally adequate. Complete preoperative examination and preparatory treatment require time, and mean that a surgical bed is occupied for a longer period. The shortage of hospital beds and the necessity for the rapid passage of patients to make way for emergency cases curtails very severely the time that can be given to this part of the treatment. But I cannot help widespread belief that an indwelling catheter and continuous irrigation after the operation are difficult measures to apply, and will cause hæmorrhage and epididymitis. This view is not in accord with my experience, and I believe that if this method, together with the other details of post-operative treatment that I have already described, were intelligently carried out, the post-operative period of healing and septic complications would be reduced. There should be no hesitation or delay in carrying out the measures for the control of hæmorrhage that have already been described. Most of the danger of hæmorrhage after operation is due to the treatment being applied too late. Hæmorrhage is too often treated when the patient is moribund instead of at the beginning when he still has reserves of blood and strength.

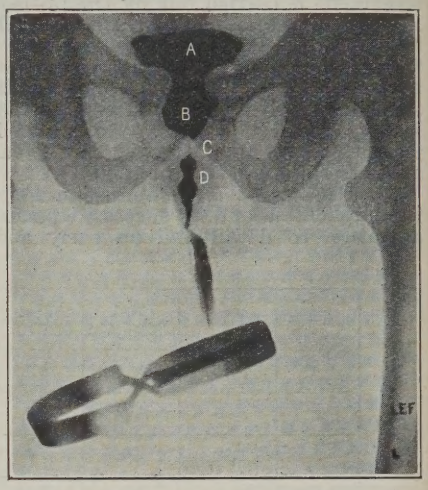
A second question that arises in regard to the mortality is the influence that the type of operation has upon the death-rate. The most important division of operations is that into one-stage and two-stage prostatectomies. In the accompanying table of cases from general hospitals the total single-stage operations, so far as could be ascertained, was 2060; of these, 424 died, a mortality of 20·5 per cent. The total of two-stage operations was 1234, of these 215 died, a mortality of 17·4 per cent. There is a saving here of 3·1 per cent. In St. Peter's Hospital statistics, the number of two-stage operations was 464 with 59 deaths, a mortality of 10·3 per cent., which is higher by 0·5 per cent.

than the single-stage operation. These figures taken at their face value are, however, misleading if a true comparison of the two operations is to be made. Where the single-stage operation is the rule, the two-stage operation is reserved for the most serious cases, and is necessarily accompanied by a higher mortality. Thus in hospitals A, B, and C the larger number of operations were performed by a single-stage operation, and only a small number by the two-stage method, and the latter carried a much higher mortality. In hospitals E, F, G, and K the numbers done by each method were much more equal, and it was evident that not the worst cases alone were selected for the two-stage operations. Here the mortality of the two-stage operation was lower than that of the one-stage. In hospital D the figures of the one-stage operation are not quite certain, as some two-stage operations were probably included, but those given under the two-stage operations represented all the prostatectomies done during two years, so that no selection of cases adverse to the two-stage operation had taken place. Here the mortality of the two-stage operation is 2·6 per cent. below the total percentage and 3·6 per cent. below the probable one-stage operation mortality. It appears from these statistics that in general hospitals where all the cases are operated on in two stages there is a moderate improvement in the death-rate. It is probable that if the two-stage operation were universally adopted in general hospital work, the difference in the figures would be greater. My own preference would be to try a more careful and prolonged preparation with a single-stage operation and more careful instruction in post-operative treatment of these cases. If it were possible to close the bladder at once in all cases, the dangers that attend the post-operative treatment of an open cystotomy wound would be greatly reduced. This is not, however, possible at the present state of our knowledge, and it is not of great benefit to close the bladder in a few selected cases.

FIG. 1.

Lipiodol injection of urethra and bladder in case of moderate enlargement of prostate. A, Intravesical projection of prostate. B, Prostatic urethra. C, Membranous urethra. D, Bulbous urethra.

FIG. 2.



Bladder and urethra after open suprapubic prostatectomy. A, Bladder. B, Prostatic bed with wide opening into bladder. C, Membranous urethra closed by sphincter. D, Bulbous urethra.

FAILURES OF PROSTATECTOMY.

The operation may be said to have failed or to be incompletely successful when free voluntary micturition is not re-established, so that there is difficulty in expelling the urine, in varying degrees up to complete inability; or when the frequent micturition and bladder irritation is not relieved; or again where there are recurrent attacks of cystitis, pyelitis, pyelonephritis or epididymitis, or the development or recurrence of stone; or where the wound does not close and a fistula persists. These failures can be traced in the great majority of cases to two causes, one or both of which may be at work—namely, sepsis and obstruction.

Post-prostatectomy Obstruction.—Obstruction after suprapubic prostatectomy varies from a slight difficulty in micturition to complete obstruction with suprapubic fistula. Other conditions than obstruction may delay the healing of the suprapubic wound after

FIG. 3.

Complete occlusion of prostatic urethra after closed suprapubic prostatectomy. A, Bladder injected through suprapubic fistula. B, Position of prostatic bed and membranous urethra. C, Bulbous urethra.

FIG. 4.

Same case as Fig. 3, after operation for relief of obstruction. Fistula closed, normal urethral micturition re-established. A, Bladder. B, Prostatic bed.

prostatectomy—namely, general debility, glycosuria, prolonged retention of the drainage-tube, and adhesion of the lower lip of a too low-placed cystotomy wound to the pubic symphysis while the upper end of the wound moves freely. The chief causes, however, are sepsis and obstruction. In the open operation with a long abdominal incision the wound heals by first intention down to the tube aperture, the urine is usually passed along the urethra about the eleventh or twelfth day after the operation, and the wound is dry on the sixteenth day. The following are the average dates on which the urine was passed and the wound dry during six years. From these statistics seven cases have been removed. Four were two-stage operations where the first stage had been done for severe sepsis, and it was not possible to resect the indurated area of the abdominal wall so as to ensure rapid healing. In another there was a fæcal fistula alongside the suprapubic wound, and another had a carbuncle that infected the wound. These cases were so unusual as to justify separation from the others in considering the common post-operation course.

Year.	Day average.	Day average.
1924	13·1	16·7
1925	12·1	16·4
1926	10·1 Urine	16·0 Wound
1927	10·0 passed.	16·3 dry.
1928	12·6	15·6
1929	11·8	16·3

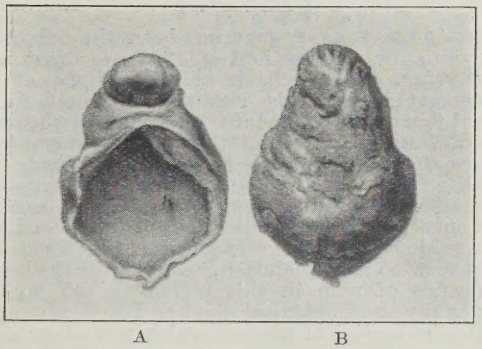
In 75 cases of severe obstruction following suprapubic prostatectomy submitted to me for consultation the following conditions were found.

1. Fibrous contraction at the site of the operation.
2. New growth in the wall of the prostatic bed due to (*a*) recurrence of simple enlargement of the prostate, (*b*) malignant growths.

Fibrous Contraction at the Seat of Enucleation of the Prostate.

There are two danger-points for the development of stricture after suprapubic prostatectomy—namely, at the membranous urethra and at the outlet of the bladder. At each of these points the mucous membrane

FIG. 5.

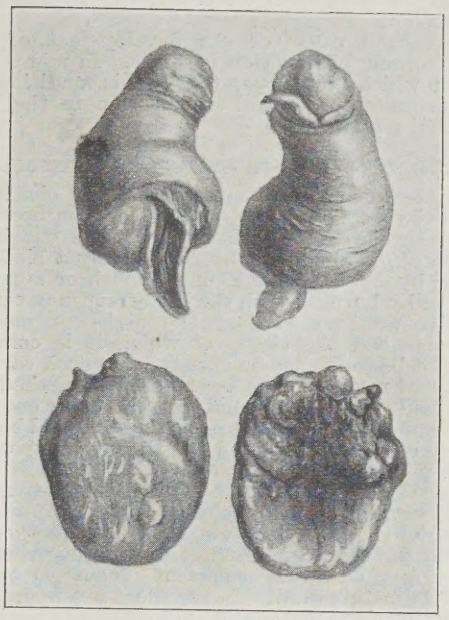


A B

Specimen of second prostatectomy for recurrence of simple enlargement of prostate. A, Anterior view. Ring of prostatic tissue and nodule at internal meatus. Wide prostatic urethra. B, Posterior view.

of the urethra is torn across. It is rare to find contraction at the membranous urethra. This only occurs in 4·3 per cent. of the cases of post-prostatectomy obstruction that I have seen. The point of narrowing in 85·5 per cent. of cases is at the opening from the bladder into the prostatic cavity. In some cases there was also the development of thick masses of fibrous tissue in the wall of the prostatic bed. In addition to fibrous contraction at the vesico-prostatic opening, there was a variety of folds and flaps of mucous membrane and nodules of prostatic tissue or of granulation tissue in the immediate neighbourhood of the outlet. In several there was a hard fibrous ridge passing backwards or laterally from the site of the internal meatus across the base

FIG. 6.



A

B

Malignant growth in pathological capsule of enlarged prostate. A, Anterior and posterior views of easily enucleated enlarged prostate. B, Anterior and posterior views of malignant growth in capsule dissected after enucleation of prostate.

of the bladder. The fibrous contraction formed a hard ring round the internal meatus, which was so narrowed as to admit a fine olivary bougie or a fine probe. In seven cases the internal meatus was completely obliterated and covered with mucous membrane, so that no trace of it could be discovered. In one of these cases a false passage had been tunnelled through the bladder base and opened into the bladder behind the trigone; in another a false urethra tunnelled through the right lateral wall of the bladder.

In all these cases the degree of obstruction was severe. In 43 per cent. there was a suprapubic fistula that had persisted since the operation. In the remaining cases there was great difficulty in micturition and recurrent attacks of retention of urine relieved with great difficulty by the passage of a catheter. In 39 cases where it was possible to ascertain the type of prostate removed at the original operation it was small, fibrous, and difficult to enucleate in 17, adherent and containing calculi in 3, and large and easily enucleated in 19. The number of the two main types of simple enlarged prostate—namely, the fibrous and the adenomatous—was practically equal. In all the cases the blind method of operation was performed, and in three it was done in two stages.

The causes of post-operation obstruction after suprapubic prostatectomy are: (1) imperfect removal of obstruction; (2) sepsis.

It is an essential part of the open method that these causes of future obstruction should be removed and that a free opening from the bladder into the prostatic cavity should be ensured, removing, if necessary, a wedge from the posterior segment of the ring of the vesico-prostatic outlet. At the end of this operation the prostatic cavity is open to the cavity of the bladder, so that there is no hour-glass formation by narrowing at the junction of these cavities (Figs. 1 and 2). The

sphincter of the bladder after suprapubic prostatectomy, as I pointed out many years ago, is the compressor urethræ, and there is no possibility, as there is no necessity, of restoring the internal sphincter. The freer the opening between the two cavities the better. I can see no object in narrowing this part of the bladder outlet, as has lately been described, and I am apprehensive that the late results of this attempt will show an increase in the number of cases of post-operative obstruction.

The second cause of the development of post-prostatectomy obstruction is sepsis. In many of the cases on which I have operated for this condition there is evidence of prolonged suppuration in the heavy scars that remain.

Treatment of Post-prostatectomy Contraction.

The treatment of post-prostatectomy obstruction may be by way of the urethra or by open operation. The urethral treatment may be carried out by the passage of metal sounds, by rupture, by a Kollman's dilator, by cutting with Young's punch or a urethrotome, or by burning with the high-frequency cautery. For the urethral method the stricture must be permeable and the tissue of which it is composed must not be too dense or massive. In such cases the passage of metal sounds is the easiest method, care being taken that the sound does actually enter the bladder and the point does not pass backward between the wall of the prostatic bed and the canopy that roofs it and push up the bladder base. For the Kollman dilator, Young's punch, and the high-frequency cautery a wide opening must already be present for the passage of the instrument, so that these methods are reserved for cases where there is a fibrous ring or a projecting fold with sufficient room to pass a No. 12/14 metal sound. In the more severe grades of obstruction these methods do not come into consideration, for the instruments cannot be introduced into the bladder.

I have now treated 40 cases of severe post-prostatectomy obstruction by open operation, and in all the cases the operation was successful in restoring free micturition without residual urine. I have elsewhere described the operation in detail.[5] The essential points are the removal of all scar tissue from the abdominal wall, free mobilisation of the bladder, and removal of scar tissue at the opening of the fistula, and exposure of the bladder base with free dissection of all scar tissue or other obstruction at the vesico-prostatic outlet and, if necessary, in the prostatic bed (Figs. 3 and 4). The after-treatment is that of a suprapubic prostatectomy.

New Growth in the Prostatic Bed.

(*a*) *Recurrence of simple enlargement of the prostate.*—Incomplete removal of the enlarged prostate, when only the intravesical projection of the prostate is removed or when only one lobe has been enucleated, is occasionally met with and is easily recognised. A more important form of development of prostatic obstruction occurs when the enlarged prostate is reconstructed after what was apparently a complete enucleation.

From a patient aged 77 I removed a large bilobed adenomatous prostate in May, 1916, by the blind method. Ten years later he began to have difficulty, and on examination the prostatic area was occupied by what appeared to be an ordinary enlargement of the prostate gland. In 1926 I removed, partly by enucleation and partly by dissection, an adenomatous nodule with a complete ring of prostatic tissue (Fig. 5). From the posterior aspect the specimen resembled an ordinary enlargement of the prostate with an intravesical lobe. From the anterior aspect the ring was complete only at the upper part; below this was an open trumpet-like tube with a smooth lining on the surface of which small openings of gland ducts could be detected. Microscopical examination showed a fibromuscular stroma with prostatic gland acini of various sizes.

I have examined a number of similar cases in consultation where the prostate appears to have been reconstructed after prostatectomy. The recurrent simple prostate undoubtedly takes origin in layers of the pathological capsule that have remained in the wall of the prostatic bed after an incomplete prostatectomy.

(*b*) *Malignant growth in the wall of the prostatic bed.*—In discussing the development of secondary malignant growth in simple enlargement of the prostate (Lecture II.), I referred to the position in which this might take origin. One of these positions is at the periphery of the enlarged gland.

The following case came under my care:—

A man, aged 64 years, had an enlarged, tough and somewhat fixed prostate which I considered as probably malignant although not hard or nodular. A round adenomatous nodule projected into the bladder and, to my surprise, a well-formed enlarged prostate with two lobes and an intravesical lobe shelled easily in one piece. On examining the prostatic bed I found a leathery capsule left behind. This I dissected out as a cuff and microscopical examination showed that it was composed of fibromuscular tissue with glandular alveoli and was infiltrated throughout with carcinoma (Fig. 6). Section of this prostate showed that the outer part only was infiltrated in places with cancer cells.

I have met with a number of cases where the prostate had been removed and it was stated that the gland had shelled out easily, yet after an interval of one or several years obstruction recurred. On examination there was a malignant infiltration of the wall of the prostatic bed. These cases belong to the group of secondary malignant growth of the prostate originating in the periphery of an adenomatous gland.

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LEFT INFRAMAMMARY PAIN.

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(*With a Note by* Dr. JOHN PARKINSON.)

Introduction.

LEFT inframammary pain has been the subject of discussion, controversy, and difference of opinion for many years. As far back as the middle of last century articles on this condition appeared in the medical journals, and in 1864 Martyn[1] described it as "one of the most frequent, intractable, and mysterious nervous affections we have to do with." Since then it has been mentioned by many writers, more especially under differential diagnosis from angina pectoris; yet in spite of this spasmodic interest in the condition, it is a subject which has seldom been directly studied with a view to its elucidation. In view of the serious significance of pain in this region to the lay and occasionally to the medical mind,[2 3] I have attempted to describe a clinical picture which will allow of its ready recognition, to arrive at some estimate of its real meaning and importance, and to discuss the prognosis and differential diagnosis.

Methods of Investigation.

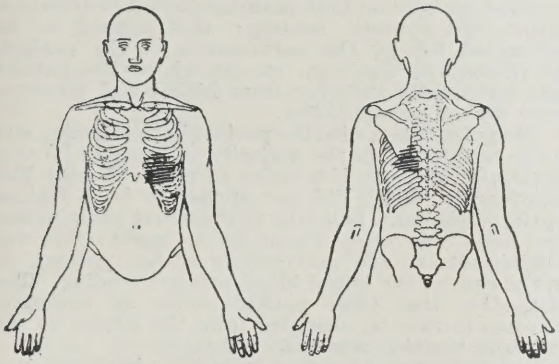
The following investigations have been made chiefly on patients attending the National Heart Hospital, with a few seen in private practice. I am indebted to Dr. Parkinson, who proposed this investigation, and provided facilities for its development.

(1) The following up of patients who are known to have had pronounced left inframammary pain as shown by their hospital records. The re-examination of them now, 5, 10, even 20 years later in an endeavour to throw some light on the clinical course, prognosis, and differential diagnosis of the complaint.

(2) The examination of a certain number of patients who from week to week have presented themselves at the out-patient department giving this pain as their chief symptom, in order to obtain an accurate and complete clinical picture.
(3) The investigation by statistical methods of the incidence of the condition in a series of consecutive out-patients.

In deciding which patients to accept for this purpose attention has been directed to severity and persistence of the pain and its duration; in searching the old records of the hospital for suitable cases all of doubtful diagnosis have been excluded. Thirty-two cases have been collected whose records go back over a number of years, the longest 29 years. From the hundreds who have attended primarily with this complaint, 20 other illustrative cases have been selected for particular investigation and observed weekly or

FIG. 1.



(Case 14). The chief site of pain is indicated by a cross. The shaded area is hyperæsthetic.

monthly. In the statistical investigation consecutive out-patient cases during the year 1927 have been chosen.

From the reading of the literature on the subject it seemed of primary importance to decide as exactly as possible what was understood by the left inframammary or præcordial region. The accompanying diagram (Fig. 1) shows the areas of hyperæsthesia found in Case 14, and it illustrates the parts under discussion; the areas involved primarily are DV and VI according to Head's segmental areas[4]; there is some extension above and below and to the subscapular region. The common association of left inframammary pain with left subscapular pain was described by Parkinson in 1919.[5]

The method of examination has been as follows:—

(*a*) Routine examination, including estimation of blood pressure and testing of urine.
(*b*) Wassermann reaction; X ray examination; electrocardiogram.
(*c*) Testing for hyperæsthesia by the simple method of lightly dragging the head of a pin over the skin. This was a method used by Sir James Mackenzie and Sir Henry Head.[4] Tenderness was then elicited by palpating with the finger tips over the same regions. The parts examined were the left breast above and below the nipple and the region about the angle of the left scapula; and the results were entered on a chart.

A Typical Case.

To introduce the subject clinically, a typical example may be quoted.

CASE 14.—A woman, aged 54, complained of an almost continuous pain under the left breast, frequently also under the left shoulder blade, along with a dull ache in the left arm. The pain was always worse after the day's work in the evening, or in bed at night. It began about two years ago as a sensation of soreness and weight, occasionally as pricking in the left inframammary region. At first there were intervals of weeks or months of relief; latterly it was almost continuous. Other complaints were exhaustion, dyspnœa on exertion, and difficulty in taking a deep breath at rest, palpitation, loss of appetite, and poor sleep. She volunteered that the skin below the left breast was often sore, and at times she could not bear her clothing against it.

On examination: a nervous, anxious woman. Pulse regular, 72 lying, 80 standing. Blood pressure, 160/90; later, 145/90. Urine normal. Routine examination of cardiovascular system, negative. Radioscopy, nothing abnormal. Electrocardiogram, physiological. Wassermann reaction negative. Hyperæsthesia, a large area in the left inframammary and mammary regions, also about the angle of the left scapula; some tenderness on palpation in both these areas (Fig. 1).

Ætiology.

Sex.—The condition is much more common in women than men; in this series were 43 women and 9 men.

Age-incidence.—Broadly there are two groups, younger patients in the late twenties and the thirties, and older patients in the late forties and fifties—that is, in women the years about the menopause. In children it is rare, and in the elderly uncommon.

Build and temperament.—This does not appear to be so clearly defined as has been suggested by some observers. Patients are either of the thin anxious type or stout and stolid; this latter build is seen more frequently in middle-aged women. The majority, it is true, present what have been described as nervous stigmata.[7]

Rheumatism.—Six only out of the series of 52 gave a history of acute rheumatism, and two of these had mitral stenosis; there appeared to be no relation between the conditions. On the other hand, so-called "rheumatic pains" in the middle-aged patient were very common.

Syphilis.—The Wassermann reaction, which was performed on most cases, was always negative.

Associated cardiovascular disease.—In this series 14 patients had signs of cardiovascular disease, 10 having high blood pressure and 4 mitral stenosis; the remaining 38 gave no evidence of structural disease. In the majority, therefore, the pain is the main feature, and no recognisable cardiovascular disease is present; statistics on this point are given later.

Immediate causes.—Though the onset is nearly always gradual and scarcely noticed, pain is occasionally described as follows: Case 26 had pain suddenly during the night following a cricket match in which he had bowled for three hours continuously. Case 16 after reaching up with the left arm for a book had sudden pain under the left breast which caused her to faint.

Symptoms.

Pain.—The patient becomes gradually aware of a discomfort in the region of the left breast, in some cases also at the angle of the left scapula. The pain is variously described; when continuous it is said to be a dull ache, a soreness, a weight, or a gnawing pain; when intermittent in character it is sharp, cutting, a prick, a stab, or a shooting pain. It is often said to radiate round the ribs or through to the left scapula. The relation to exertion is indefinite, perhaps it is felt most commonly when the patient is tired, after exertion; it is seldom induced by effort, though the constant pain may be accentuated by it; it is felt at rest and in bed at night. It is very rarely of great severity, though in five of the series it was momentarily sufficiently bad to cause loss of consciousness. Patients generally agree that rest improves the symptoms, whereas work, exertion, excitement, and fatigue aggravate them; some will even volunteer that they get relief from movement, especially those who get the pain at night and cannot rest in bed. There are seldom the secondary effects such as sweating, pallor, which are expected in severe forms of pain. Tenderness of the skin is often a complaint; a patient will say that during an exacerbation the pressure of the clothes gives discomfort.[8] If the pain has been of long duration the patient will

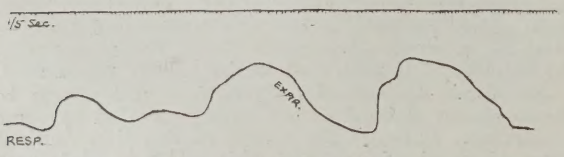
have had considerable intervals of relief followed by relapses.

It is important at this point to realise that the associated phenomena are most helpful in arriving at a diagnosis. Gallavardin[9] has said: "The general impression left the physician is the extreme diffuseness of the manifestations; there are so many things that there are too many."

Exhaustion.—A symptom on which Mackenzie[10] laid stress is nearly always volunteered by the patient without questioning and it is often complained of quite as bitterly as the pain; this feeling is independent of work done and is claimed to be quite different from natural fatigue after exertion.

Dyspnœa on effort of a moderate degree is also a common complaint, as would be expected in the

FIG. 2.



Polygraphic record of the sighing breathing common to left inframammary pain.

lowered condition of health of which it can be an expression; with associated overweight it may be considerable. In contrast with exhaustion, for instance, dyspnœa is seldom mentioned until the routine inquiry is made.

Deep sighing respiration (see polygraphic record in Fig. 2).—Dyspnœa on exertion must not be confused with this symptom, named "suspirious" by the older writers—for example Walshe[11]—and fully appreciated by them as a "neurosal" disturbance.[12] Modern writers refer to it in such terms as "deep sighing respiration," "inability to take a full breath," "an unsatisfying breath," "irregular sighing respiration." This is a very common symptom in patients with left inframammary pain, notably at rest, not on exercise. Gallavardin[13] has commented on this association, and has noticed while screening patients during an attack that there appears to be a spasm of the diaphragm.

Palpitation.—This is a symptom in about 60 per cent. of patients, but not a very prominent one, except where there is associated high blood pressure or with much tachycardia.

Dyspepsia.—About 31 per cent. of patients complain of dyspepsia usually in the form of flatulence. This is of interest since it is common to hear this type of pain loosely ascribed to indigestion.

Pains elsewhere.—Complaint of pains and stiffness in other parts of the body is elicited from the majority, but on questioning only, since the pain under the left breast is, to the patient, by far the most important symptom.

Fainting and faintness.—Fainting, that is actual loss of consciousness, is unusual in this condition, although the pain was sufficiently severe to cause it in five of my patients. Feelings of faintness unassociated with pain, and particularly following exertion, often came with the long list of complaints.

Insomnia or disturbed sleep is a common association, there is generally no reason offered. In a few the pain may be the cause; they say "They don't know which way to lie"; and may get relief from walking about. In some we hear of a feeling of "sinking through the bed."

"*Nerves.*"—It is the rule for these patients to state that "My nerves are bad."

Giddiness.—Patients will often say they are giddy; this, on inquiry, is found to be a sensation of swimming or floating, not true rotation; the patient feels the ground is not firm beneath the feet.

Trembling and shaking.—This is a frequent complaint, often said to come in attacks.

In this condition where the diffuseness of the symptoms is the cardinal feature, the patient may not confine herself or himself to the complaints enumerated above, and such phrases as a "choking sensation in the throat," a "feeling of suffocation," "pins and needles in the limbs" will be familiar to everyone. Sir Clifford Allbutt[14] has said, referring to left inframammary pain "these faintnesses, palpitations, gaspings, stiflings, bodily agitations, hyperæsthesias, and psychical commotions are so wholly unlike the ruthless grip of angina pectoris as these frantic alarms are unlike its silent passion."

Physical Signs.

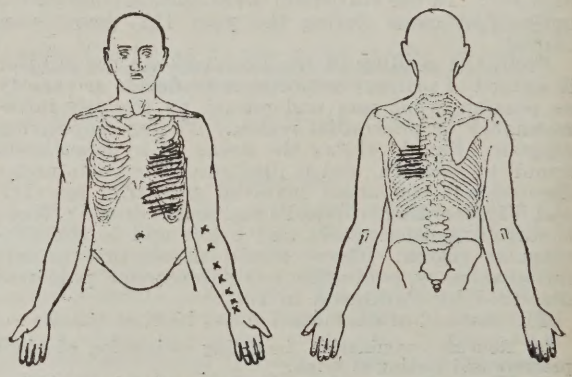
Signs were necessarily few as symptoms constituted the essential feature in this condition. X ray and electrocardiographic examinations gave results within normal limits the Wassermann reaction, when tested, was without exception negative and nothing abnormal was found on investigation of the urine.

Blood pressure on first examination often showed a fairly high systolic reading; this seemed to be accounted for by the nervousness of the patient, as subsequent readings, except where the patient was admittedly suffering from high blood pressure, were within normal limits.

The pulse, taken with the patient both standing and lying, was found in the majority of cases to be of a moderate rate. In this series 25 per cent. only had tachycardia, which did not appear to be a feature of the condition. It is true that on first examination the pulse was often found to be rapid; this was attributable to the nervousness of the patient, as in the case of the initial blood pressure reading. The suggestion that these patients show an abnormal increase in rate on changing from the sitting to the standing position was not confirmed.

Hyperæsthesia proved a valuable sign and was positive in 68 per cent. of the series of both old and

FIG. 3.



(Case 24). Sites of pain are indicated by a cross. The shaded area is hyperæsthetic.

new. It was elicited by lightly dragging the head of a pin over the skin; the diagrams accompanying the illustrative cases show the usual distribution. The left inframammary region was found to be positive to the test more frequently than the left subscapular region. Tenderness on palpation with the fingertips was found in about 45 per cent.

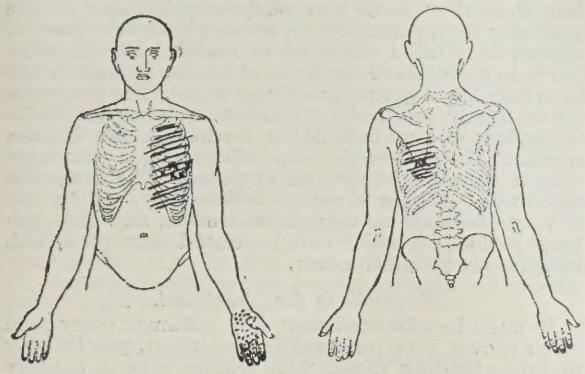
The following are three illustrative cases of long-standing left thoracic pain:—

CASE 24.—A spinster aged 39. In November, 1920 attended the out-patient department of the Heart Hospital complaining of pain under the left breast when tired; it was dull and drawing in character. Two weeks previously, while kneeling in church, she had been suddenly seized by an exacerbation of the pain and fainted. On examination nothing abnormal was found; she was reassured and discharged. In September, 1927, attended again because of a faint in the street. Complained of pain under the left breast at the left scapula, and in the left arm; an ache felt during

exertion, after exertion, and sometimes at rest. Other complaints were undue exhaustion, shortness of breath. Examination: again negative. In April, 1929, attended by request. She felt better, but still had pain when tired or sitting at the end of the day; had also had five attacks of pain at night. Other complaints were great exhaustion, difficulty in taking a full breath. Examination: a thin, anxious woman. Nothing abnormal was found in the cardiovascular system. Pulse-rate 80 and regular. Blood pressure, 120/80. Hyperæsthesia to the head of a pin drawn lightly over the skin, and tenderness to palpation with the finger-tip (Fig. 3).

CASE 1.—A married woman aged 53. In February, 1915, attended the out-patient department of the Heart Hospital complaining of pain below and above the left breast with a dead feeling down the left arm; it was almost continuous.

FIG. 4.



(Case 1). Sites of pain are indicated by a cross, shaded areas are hyperæsthetic. Feeling of "deadness" over the dotted area.

made worse by exertion and improved by rest in bed. Other complaints were palpitation, exhaustion, shortness of breath on exertion, loss of appetite, and poor sleep. On examination nothing abnormal was found. The patient continued to attend on and off till 1920, being treated with drugs, liniments, and plasters. In October, 1920, she was again completely re-examined; nothing abnormal being found she was reassured and discharged. In April, 1929, attended again by request. She still complained of pain, and now sometimes it was felt under the left shoulder-blade. Other complaints were undue exhaustion, bad palpitation, flatulence, and a difficulty in taking a deep breath. Examination: a stout woman of good physique. Nothing abnormal was found in the cardiovascular system. Pulse-rate 80 and regular. Blood pressure 160/95. Hyperæsthesia and tenderness to pressure (Fig. 4).

CASE 8.—A spinster aged 32. In March, 1920, attended the out-patient department of the Heart Hospital complaining of "pain at the heart"; it was continuous and spread to the left elbow, causing a feeling of loss of power in that arm. Other complaints were undue exhaustion, palpitation, shortness of breath on exertion, and indigestion. On examination nothing abnormal was found. Patient continued to attend, always with the same complaints. On one occasion note is made that the pain was felt at the left scapula, and she was unable to lift her arm to do her hair. In April, 1920, she was again completely re-examined, nothing abnormal was found, and she was reassured and discharged. In April, 1929, attended again by request She still complained of the pain, but it was not so severe now as it used to be; it was generally sharp and shooting in character, shooting round the line of the ribs to the angle of the left scapula. Other complaints were great exhaustion, severe palpitation, nerves bad, and a difficulty in taking a satisfactory breath; "have to take deep sighs." Examination: a thin anxious woman, with a continuous coarse tremor of the hands. Cardiovascular system normal. Hyperæsthesia and tenderness to pressure (Fig. 5).

Statistics of a Series of Consecutive Cases.

Out of 332 consecutive cases attending the out-patient department of the National Heart Hospital, it was found that 42·3 per cent. presenting no evidence of cardiovascular disease complained of left inframammary pain, whereas only 22 per cent. of those with organic disease suffered in this way. The statistical significance of these figures is that a patient suffering from this type of pain is more (not less) likely to be normal so far as the heart condition is concerned.

A further consecutive series of 266 was collected comprising normal patients and those suffering with high blood pressure or mitral stenosis; these latter conditions were chosen as representing the commonest cardiovascular diseases. It was found that of 43 per cent. normal patients, 63 per cent. gave this pain as their chief complaint and 37 per cent. as one of other symptoms; of 22 per cent. with mitral stenosis, 12·5 per cent. only gave it as their chief complaint, the rest mentioning it among other symptoms. Of 33 per cent. with high blood pressure, 57 per cent. gave it as their chief complaint, the others as one of other symptoms. The statistical significance of the percentages 43 per cent. normal, 22 per cent. with mitral stenosis, and 33 per cent. with high blood pressure, is the same as for the first series—namely, that a patient suffering from this type of pain is more likely to be normal and less likely to be suffering from either high blood pressure or mitral stenosis.

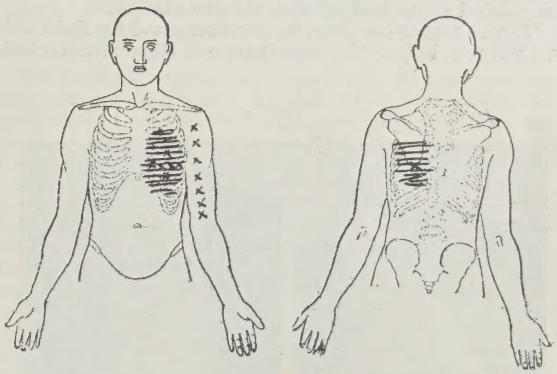
TABLE I.—*Total Cardiovascular Cases.*

—	Pain.	γ^2	P.
	Per cent.		
Normals	42·3	15·3	0·0015
Cardiacs	22·0		

TABLE II.—*Mitral Stenosis and Blood Pressure Separately.*

—	Pain.	γ^2	P.
	Per cent.		
Normals	43·6	—	—
Mitral stenosis ..	22·0	9·5	0·0236
Blood pressure ..	33·3	0·8	0·8100

FIG. 5.



(Case 8). Sites of pain are indicated by a cross, shaded areas are hyperæsthetic.

Diagnosis and Differential Diagnosis.

The diagnosis is based chiefly on the site and type of the pain, with its indefinite onset as opposed to the paroxysmal character of the attacks in angina pectoris, and an absence of any direct relation to exertion. In addition there is a diffuse array of symptoms largely of a nervous order and dependent on a lowered condition of general health. Further there is an absence of physical signs unless there happens to be associated cardiovascular disease, and negative results from electrocardiographic and X ray examinations. The presence in the majority of

hyperæsthesia and tenderness in the inframammary and subscapular regions is confirmatory evidence. In differential diagnosis it is of first importance to distinguish this condition from true cardiac pain. This presents no real difficulty except where there is extension of the pain into the left arm. The following Table has been assembled to contrast the two conditions.

Differential Diagnosis from Angina Pectoris.

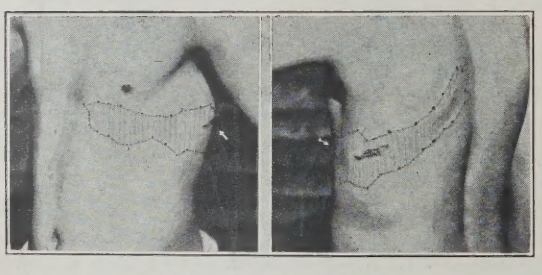
Angina Pectoris.	*Left Inframammary Pain.*
1. Commoner in men.	1. Far commoner in women.
2. Occurs during effort or excitement; effort is limited by pain.	2. Occurs any time, especially during fatigue; effort is limited by exhaustion rather than pain.
3. Pain in brief paroxysms, onset and offset abrupt; the paramount symptom.	3. Pain generally continuous, lasting weeks or months with intermissions, onset and offset gradual, duration indefinite: one of many symptoms.
4. Site of pain sternal, or across the chest, extension supramammary or brachial; spinal distribution C8, D1, 2, 3, also 4.	4. Site of pain left inframammary extension to left scapula, less often supramammary, rarely and slightly left brachial; spinal distribution DV, and VI.
5. Aspect expresses great pain.	5. No outward aspect of pain.
6. Hyperæsthesia none or only following a paroxysm.	6. Hyperæsthesia common and persistent, especially in long-standing cases.

Other Sources of Pain in the Left Inframammary Region.

It is, of course, recognised that pain under the left breast can be a manifestation of a pathological change in the structures of the chest wall and the organs and tissues, other than the heart, contained therein. When due to a local lesion the clinical picture and course is not that described in this paper, and the associated signs and symptoms are absent.

Herpes zoster (see Fig. 6), as mentioned by Balfour[15] in 1898 can, before the appearance of the characteristic

FIG. 6.



Herpes zoster (D. VI. left) with area of hyperæsthesia to dragged pin-head.

eruption, give pain under the left breast and at the angle of the left scapula. Again, myalgia and myofibrositis of the muscles of the chest wall, sometimes called pleurodynia, gives pain in this area; G. R. Murray[16] has recently shown how this condition may readily be diagnosed. To give yet one further example, Vaquez[17] has described a cellulitis of the præcordial region due to continual fingering of the part by the patient; tender patches of induration can, he says, be found on examination.

Other conditions that should be mentioned are acute pleurisy, recognised by the "catch" in the breath and associated "rub," or if the result of chronic pleurisy and fibrosis of the lung, by X ray examination. Intercostal neuralgia gives pain along the main distribution of an intercostal nerve. Pain due to lesions involving the lower end of the œsophagus and cardia of the stomach is described in detail by Bolton.[18] According to Pottenger[19] and others the innervation of the stomach, liver, and pancreas is from D.V to IX, an area including that under discussion—namely, D.V and VI. Among the rarer causes of left inframammary pain the following might be enumerated: mastitis of the left breast; osteo-arthritis of the spine, recently discussed by Gunter and Sampson;[20] disease affecting locally the posterior spinal nerve roots as aneurysm, neoplasm, or tuberculosis of the spine; fracture or periostitis of a rib; pneumothorax, mediastinitis, chronic and acute, and intrathoracic neoplasms involving structures of the mediastinum.

After-history and Prognosis.

The after-histories of the 32 cases whose records go back over a number of years show that these patients have had long remissions from their pain, but that they have had relapses coinciding in the majority with some illness, extra physical or mental strain, or reduced condition of health. For the most part they still have the pain at times, though in one case only has it got progressively worse. The prognosis as to life is good, the condition appears not to be dependent on any underlying cardiovascular disease, nor need the patient develop other signs or symptoms over a considerable period of years. The prognosis as to relief of pain is not so satisfactory, the trouble is very obstinate as regards treatment, and although long periods of relief can be confidently predicted, relapses are prone to occur.

Suggestions for Treatment.

It must be admitted that left inframammary pain often proves very resistant to treatment, particularly in long-standing cases, who seldom lose it entirely and in whom it tends to recur; the earlier after its onset the patient comes under treatment the greater the prospect of success. Probably the most satisfactory results are obtained with patients who are quick to accept the assurance that the pain has no relation to the heart. As the trouble is frequently associated with a lowered condition of health, mental strain, or overwork, much benefit results from rest, the pain improving and in some cases disappearing after a few days in bed. Where mental strain is the chief factor, inquiry should be made to see if any personal or domestic worry can be lightened. A holiday with a balanced amount of rest and exercise, fresh air, and tonics may be advised with good results. Any obvious focus of infection should naturally have attention. Excessive smoking seems to be a potent cause in some cases, and abstinence will often be necessary to obtain a cure. Of drugs, that which seems to have the most effect is bromide; little if any relief is got from the use of the usual analgesics, such as aspirin, phenacetin, phenazone, &c. Local measures are not advisable, as they tend to centre the patient's mind on the heart, a thing particularly to be avoided. Plasters have been freely used in the treatment of this complaint, with, however, no permanent relief of symptoms; one patient who had been plastered over a period of 11 years still had his pain. Similarly, massage has been recommended for the painful parts, but the results again do not support its use.

Summary.

Left inframammary pain is a very common symptom in patients without physical signs of disease, but with a group of symptoms expressive of physical or nervous exhaustion. It not infrequently leads to an erroneous diagnosis of heart disease, even of angina pectoris. Thirty-two cases have been studied whose records show that their condition has been one of long standing, together with 20 illustrative examples, with this pain as the main symptom. Further, the histories of 332 consecutive patients attending the out-patient department of the National Heart Hospital have been analysed, and it has been found that no less than 22 per cent. gave it as their chief complaint, and a further 20 per cent. included it amongst their symptoms. The condition is far

commoner in women than in men, affecting them in adult life, especially at the menopause. The pain is of gradual onset, and continues for weeks or months with intermissions, often over years. It may extend to the left scapula, less often to the supramammary region, or even to the left arm; this left brachial extension was found in 17 of the 32 cases showing long records; it may then simulate angina pectoris with which it has nothing else in common. A striking feature is its association with the symptoms indicative of nervous exhaustion and general ill-health, the most permanent symptoms being undue fatigue, nervous disturbances in breathing, and palpitation. The most significant physical sign, indeed almost the only one, is the presence of hyperæsthesia of the skin and tenderness of underlying tissues in the region of the left breast and the subscapular region. Signs of cardiovascular disease are not found, except when such common conditions as mitral stenosis and hyperpiesia happen to coexist. The distinction from angina pectoris rests upon the character of the pain and its site, the absence of a direct relation to exertion, and the lack of supporting physical signs after years of pain. A table of differential diagnosis is given. The prognosis as to life is good, as there appears to be no organic basis for this pain; but it is obstinate and very liable to recur, though it does not progress as does angina pectoris. Treatment is unsatisfactory, but the best results are obtained by reassurance, rest in bed for a time, improvement of the general and nervous health, a course of bromide, and if possible a holiday.

NOTE BY DR. JOHN PARKINSON.

A persistent aching pain below the left breast is so common a complaint and so liable to misinterpretation that Dr. Baker's study is sure to prove of wide interest. Now that coronary thrombosis is distinguished from angina of effort it is more necessary than ever to separate clearly from angina pectoris (in either form) these imitations of true cardiac pain. Left inframammary pain, especially if there is slight extension to the left arm, undoubtedly comes most often into such differential diagnosis. The original site, the absence of direct relation to effort, and the associated symptoms are here shown as a clinical complex in striking contrast with angina. Hyperæsthesia is found to be more common and more persistent than in coronary angina. The underlying nervous and general exhaustion, coming to the surface as a "heart-ache" instead of a headache, is treated best by moral support, reassurance, and rest; then by holiday and wholesome exercise.

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POST-ENCEPHALITIC PARKINSONISM AND MILITARY PENSIONS.*

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PENSIONS boards often find it very hard to decide whether post-encephalitic parkinsonism is or is not to be imputed to military service. This question is of the greatest importance, but I have found no information on it in English medical works. In France it is dealt with in the following way.

Determination of the Origin of Encephalitis.

Post-encephalitic parkinsonism generally occurs a year or two after the onset of encephalitis, or even three, four, five, or more years later. The expert endeavours to find out whether a bradykinetic syndrome [1] can be attributed to an encephalomyelitis contracted during the period of military service or not. The first difficulty is to determine the beginning and the signs of this primordial encephalomyelitis, for opinions are not always in agreement. It was for some time held that, encephalitis having only been described at the end of 1916 or the beginning of 1917, all Army patients who ascribed the beginning of their illness to an earlier date could not have encephalitis, since it did not then exist. This opinion is no longer accepted, as I have been able to demonstrate,[2] that cases were in existence on the French front as early as 1915 in the region of Commercy and Verdun, later in Bar-le-Duc from 1916 to 1917.

The case recorded by Arthur J. Hall[3] in 1924 is particularly significant. It is the case of a soldier aged 37, sent home from the Anglo-French front in 1916, and considered to have an "atypical" paralysis agitans. It was not until 1918 that he made the correct diagnosis. It is probable that the beginning of the illness was earlier than 1916, the date of the first examination.

There is a growing tendency to think that encephalitis arose in the war zone from 1914, but was at first unperceived and developed, especially in the eastern region. From there it was diffused over the different fronts by the movement of troops and spread to the various parts of the world. Maximilian O. Pfister,[4] in an article dated June 28th, 1929, supports this opinion as regards the appearance of encephalitis in China; he refutes Watson's hypothesis according to which the first case, a completely isolated one, was noted in Yunnam in 1915, and the disease was propagated from there in China from 1918 and 1919. According to Pfister, it was the Annamite troops, engaged in the district of Verdun in 1915, who brought the malady back to China at the time of their repatriation, beginning in the autumn of 1915. Encephalitis first broke out in the ports of Annam and was progressively disseminated through the whole country, following the most frequented commercial routes.

The Diagnosis of Encephalitis is not Necessary to Establish a Causative Connexion.

Diagnosis is only of use to the expert in so far as it allows him to appreciate the damage caused—that is to say, the degree of disablement. A diagnosis of encephalitis is not really indispensable. The Ministry of Pensions simply wants to know whether the infirmity may be attributed to service. They must then know if there is causative connexion between the present state of parkinsonism and a cause of whatever kind during the period of active service. There are a number of military men who returned home in perfect health and in whom the first symptoms of encephalitis did not manifest themselves until long

* Read on June 6th at the Naval, Military, and Air Section of the Congress of the Royal Institute of Public Health in Portsmouth.

after their demobilisation; in those cases causative connexion cannot exist and the imputation is inadmissible.

Therefore the demonstration of a causative connexion is the essential point and is sufficient to cause a pension to be awarded to a soldier suffering from parkinsonism, although it may be impossible to attribute the disorder to an encephalitic origin.

In certain cases the diagnosis of encephalitis is simple, for instance, in the lethargic type. When one finds in the history of a parkinsonian soldier during active service fatigue and somnolence, fever, even though moderate, disordered vision, and especially diplopia, the problem is solved; the pension is always awarded. But such characteristic symptoms are not always found. Should traumatism and concussions, febrile states, especially influenza, malaria, and other causes be rejected, or must they be called "encephalitis," which at the time escaped recognition? The only essential fact is that the causative connexion should be obvious; consequently each case must be carefully studied in order to find out, by close examination, if this connexion is evident to the expert.

Original Causes of Post-encephalitic Parkinsonism.

The most typical and usual cause is influenza; it is a well-established fact that the most serious outbreak of epidemic encephalomyelitis coincided in 1918 with influenza. According to certain authors, epidemic encephalomyelitis is only one of the nervous forms of influenza. Dr. F. G. Crookshank [5] defended this view as early as 1919, bringing forward arguments based principally on the history of epidemiology for the last 450 years. For him epidemic encephalomyelitis represents the nervous form of influenza in adults, while epidemic poliomyelitis is the nervous form of influenza in children. As a result of the 1929 report of the American Matheson Commission [6] on epidemic encephalitis, the majority of authors do not to-day share this opinion. The arguments against it may be summarised as follows.

Influenza is essentially contagious. Encephalitis is scarcely so. Nothing suggests a constant relationship between the two diseases. The ideas suggested by epidemiology permit us rather to oppose the one to the other. It is difficult to pronounce judgment on the identity or the difference between encephalomyelitis and Medin's disease. The cases of poliomyelitis observed at Bordeaux were exceptional, whereas in outbreaks of epidemic poliomyelitis or Medin's disease myelitic lesions are the rule and encephalitic lesions the exception.[7]

These divergences of opinion, which persist to-day, are interesting but unimportant. To an expert it is simply a question of nomenclature; whether we call the initial symptoms nervous influenza, epidemic encephalomyelitis, or poliomyelitis, the mere fact that they were in existence and that the causative connexion with the later parkinsonian syndrome can be established settles the question from the legal point of view, and the pension must be awarded. It is well known that many cases of influenza have thus been judged, such as that of Mayet and two other cases of my own.[8]

Another disease, often suspected, is typhoid fever. As early as 1917 I remarked, with Moutier and Calmettes,[9] that a typhoid condition was legitimately ascribed to those tired and asthenic soldiers returning from the Army. The biological tests were always negative, it is true, but they might have been positive in a few cases, as Marc Etienne May and M. Kaplan have indicated. These authors record hypertonia and forms of encephalitis in true typhoid fever. The characteristics which they mention are analogous to those which we observed in our first patients in 1917 at the beginning of their disease.

In other cases we thought at first of atypical cerebro-spinal meningitis or of the polymorphic psychoses, especially dementia præcox, which later show a parkinsonian syndrome. Why should we deny the possibility of cerebro-spinal meningitis or psychosis of any kind turning into a parkinsonian syndrome? In fact, we must accept the causative connexion if we can follow the morbid phases from the beginning to the parkinsonian sequela.

Certain experts have refused to admit a connexion between malaria and the parkinsonian sequela. There is, however, no reason to deny it, if the causative sequence can be proved. I have noted several cases in which the malarial origin has been accepted, among them that of Bériel and Mayet, and another in my own experience.

In this case the characteristics of parkinsonism began to appear in December, 1921—that is, about 19 or 20 months after the attack of encephalitis, a normal length of time; they manifested themselves in difficulty of movement, stiffness and slowness at work. In February, 1922, they were very clear and Prof. Cestan (of Toulouse) diagnosed encephalitis with parkinsonism, which grew worse later on. But can this parkinsonism syndrome be connected with active service in the relation of cause and effect? One fact is clear, that the attack of encephalitis in February, 1920, began like one of those malarial crises which had already attacked the patient at Salonica, where he was in hospital from April 9th to May 18th, 1918: uneasiness, shivering, chattering of teeth, and high fever. These symptoms were followed after some hours by profuse perspiration with subsequent comfort, but on the following days the signs reappeared and this condition—at first intermittent—was succeeded by a permanent state of fever which persisted for forty days. Therefore the onset took the form of intermittent fever of a quotidian type—that is, a recurrence of serious malarial symptoms in a former malarial patient, the beginning of whose disease, contracted on active service, dates from 1918.

I saw a similar case in a soldier who clearly had had ten malarial attacks at Salonica before his return to France in January, 1919. He had no further attack until his demobilisation in November, 1919. In January, 1919, he had a bad attack with shivering, chattering of the teeth, and hyperthermia, which appeared to be cured by quinine. Two days after, diplopia and somnolence appeared, while the fever abated. This was the beginning of encephalitis, which had first manifested itself under the appearance of a malarial attack and later turned into regular parkinsonism, from 1921 to 1922. I consider that here, as in the preceding case, there is undeniably a connexion between the malaria contracted in the Army and encephalitis complicated later by a parkinsonian syndrome.

Diffuse meningo-encephalitis is admitted as a sequela of malaria by the ablest authors on tropical medicine. I will confine myself to quoting the opinion of Prof. A. Le Dantec [10] who, in the latest edition of his remarkable précis, concludes that the right to the pension is undoubted in two cases.

The same may be said for trauma and concussion. It is well known that Parkinson's disease has sometimes been provoked by similar causes.

I had a case of that kind in December, 1926. It was the case of a quartermaster, badly concussed by a shell in July, 1917, who, in spite of violent shock, remained at the front until October, 1919. During all this time he complained unceasingly of headache, was continually depressed, and resigned his position as quartermaster. About six months before demobilisation he showed a tremor, at first slight, which grew steadily worse, his movements becoming more and more difficult and slow, especially on the right side; he took several holidays and when he was finally examined in August, 1924 a parkinsonian syndrome was recognised which predominated on the right side, with rigidity, a mask-like face and tremor of the left hand. In May, 1926, the expert first accepted the causative connexion between the original concussion of 1917 and the present parkinsonian syndrome. It seems difficult not to agree.

There is no reason why poisoning should not be incriminated. It is well known that at first, especially in England, botulism was held responsible. Indeed, one cannot refuse the pension if a causative connexion exists between the supposed poisoning or intoxication contracted while on active service and the later parkinsonian syndrome.

The Original Cause is Indefinite.

To discuss other and rare cases seems superfluous. The essential fact is that the initial cause may be impossible to define, and yet, because it has been observed, it should be sufficient, if there is a causative connexion, to determine the decision. Among cases

of this type, in which retrospective diagnosis was impossible, are the following.

A draughtsman, aged 46, came to me for the first time on August 5th, 1926. A diagnosis of post-encephalitic parkinsonism was obvious from the characteristic mask-like expression, inertia, wooden immobility, and monotonous speech. I saw him several times in September, 1926, and in November, 1928. His condition was always the same. In good health at the time of mobilisation on August 2nd, 1914, he had remained so until July, 1916. At that time, being in the neighbourhood of Beauvais, he had been removed from that town to a dressing-station, where he had remained for a month suffering from agitation, mental excitation, and trembling of the upper and lower limbs. His writing had become almost illegible and his speech jerky and explosive. Since then he has been unlike his former self; excitable, talkative, irritable, with a great need for activity, finding it impossible to stay in one place, walking about incessantly, even making magnificent and exaggerated plans for the future. In May, 1917, myoclonic spasms appeared in the limbs and were so violent as to wake him in the night and shake the bed. These spasms continued after demobilisation (March, 1919), and for the two following years. In November, 1919, somnolence and diplopia appeared; the latter disappeared in December but the somnolence persisted until February. He became less and less voluntarily active; he drew badly and was obliged to have an employee to take his place. The myoclonic spasms diminished, then disappeared at the end of 1921. Finally, in November, 1923, after financial difficulties, he sold his draughtsman's business.

Several doctors whom he consulted diagnosed encephalitis. My conclusion is that the origin of the encephalitis, which apparently dates from the period of somnolence and diplopia in November, 1919, is certainly earlier. It may be said that since July, 1916, the time of the patient's removal and treatment at Beauvais, he has been continually ill. Therefore it is only logical to refer the origin of the encephalitis back to the mental symptoms manifested since July, 1916. Consequently, I conclude that the origin of the present post-encephalitic parkinsonism dates from July, 1916, —that is, from the time when the patient was in active service. As I requested in my report, the pension has been awarded.

These considerations, based on precise facts, show how many complex and delicate problems are raised by this question of the claim of parkinsonian patients to military pensions.

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WOOLWICH MEMORIAL HOSPITAL.—Last year the number of in-patients rose from 1293 to 1850, who cost an average of £4 3*s.* per week, a slight increase upon the previous year.

HONORARIUM TO A HOSPITAL MEDICAL STAFF.—The governors of St. Albans Hospital have decided to grant this year the sum of £150 to the honorary medical staff. The amount was settled in consultation with the medical men concerned, and is subject to periodical revision. Last year there were 544 in-patients, an increase of 90; their average stay was 20·70 days. Road accidents were responsible for 123 in-patients—more than 20 per cent. of the total—and 180 casualty patients. The in-patients cost £3 1*s.* 10*d.* per week.

PARALYSIS OF THE LAST FOUR CRANIAL NERVES IN TABES DORSALIS.

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THERE are few cases of tabes dorsalis which do not show, sooner or later, evidence of involvement of the cranial nerves in addition to the usual spinal manifestations of the disease. Some degree of trigeminal anæsthesia is almost invariably found in the moderately advanced case, and strabismus, optic atrophy, and deafness are all quite common. But while some cranial nerves fall victims to the disease very readily, others appear to enjoy a high degree of immunity, and it is but rarely that the glossopharyngeal, spinal accessory, or hypoglossal nerves are affected. It is for this reason that the present case, in which the last four cranial nerves on the right side have been affected, is deemed worthy of record.

A chemical worker, aged 49, was first seen in the out-patient department at the Liverpool Royal Infirmary in July, 1928, and was later admitted to the hospital.

In 1903 he had had a urethral discharge but no chancre had been noticed. His only other illnesses had been recurrent tonsillitis and quinsy in 1917, and an attack of abdominal pain and hæmatemesis in 1922, following a prolonged period of dyspepsia. He had been married for 22 years and had had seven children, all of whom were alive and well. There had been no miscarriages. He had enjoyed very good health for several years before the onset of the present condition, except that for 18 months he had noticed occasionally a sensation as of "walking on air." Dysphonia had first been noticed in April, 1928, after a severe cold and sore-throat, and had been quickly followed by dysphagia. Food had appeared to stick at the level of the manubrium sterni and very soon he could only with difficulty swallow fluids. Regurgitation into the nose had occurred occasionally. There had been a constant tickling sensation in the throat, but no pain. In May he had first experienced lightning pains of some severity in the legs. In June pain had been felt under the right clavicle, and on looking at himself in a glass he had noticed what he described as a "different formation" of the right shoulder. His weight had fallen from 9 st. 2 lb. to 7 st. 8 lb.

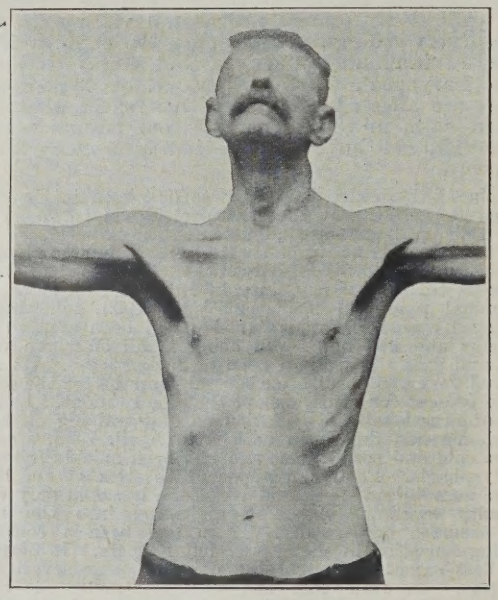
When first seen he presented a worn and emaciated appearance. His voice was husky and there was a frequent and ineffective bovine cough. When stripped, the deformity and dropping of the right shoulder was obvious, and further examination showed this to be due to considerable atrophy of the sternomastoid and trapezius. There was marked hollowing above the clavicle, and the right scapula was displaced outwards and slightly downwards. Measurement showed the distances from the superior and inferior angles to the vertebral spines to be respectively 4¼ in. and 3 in., as compared with 3⅜ in. and 2¾ in. on the normal side. The scapula as a whole was half an inch lower than its fellow. The muscles, in spite of their atrophy, responded well to faradism and galvanism, though in the sternomastoid the anode closing contraction was equal to the kathode closing contraction.

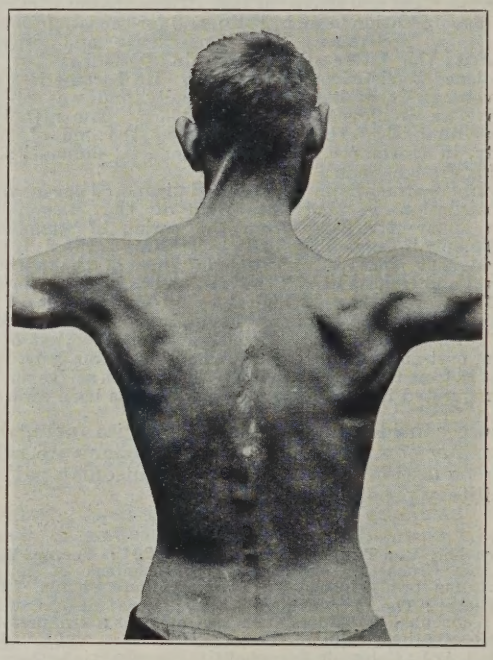
Examination of the pharynx revealed weakness of the right half of the soft palate, the uvula being drawn over to the left on phonation. The pharyngeal wall and fauces were hypersensitive and the reflex response to stimulation excessive. This hypersensitivity was, however, less marked on the right side. The tongue deviated slightly to the right on protrusion but there was no atrophy or tremor. Common sensation was normal over its surface, except over the right posterior third where there was some impairment. Taste was examined with test solutions of sugar, salt, acetic acid, and quinine. This sensation was completely lost over the right posterior third. It was present over the rest of the tongue but there was often considerable delay before a given test solution was identified. Inquiry revealed no subjective alterations in taste or smell. The fifth, seventh, and eighth nerves were functioning normally. There was slight double ptosis. The eye movements were normal and there was no nystagmus. The pupils were small, the right more so than the left. Both showed some irregularity, and the reaction to light was

absent on the right side and only feebly present on the left. Accommodation was brisk. The cilio-spinal reflexes were absent. There was no impairment of visual acuity and the optic fundi and visual fields were normal.

Otherwise there were no signs of nervous disease. The gait was normal, there was no rombergism, no ataxia, and no alteration in muscle tone. The knee-, ankle- and arm-jerks were all brisk and the plantar reflexes flexor. The abdominal reflexes were present. There was no sphincter disturbance. The varieties of sensation examined were touch, tactile localisation, temperature, superficial and deep pain, vibration, joint, and testicular, and all were found to be normal. There were no trophic disturbances. No evidence was found of any lesion outside the nervous system apart from slight arterial thickening. The pulse-rate varied from 70 to 100 and the heart was normal.

Laryngoscopy showed complete paralysis of the right vocal cord with some abduction paralysis of the left. Œsophagoscopy revealed no structural disease of the pharynx or œsophagus. Radiographic examination of the œsophagus showed obstruction to the passage of the test paste in the post-cricoid region, the appearances being indistinguishable from those usually produced by malignant disease. The contour and movements of the stomach, as seen under the screen, were normal, as also were the movements of the diaphragm. The electrocardiogram was normal in all leads. The serum Wassermann reaction was negative. In the cerebro-spinal fluid the protein was increased and the cells numbered 20 per cubic millimetre, all lymphocytes. The Wassermann reaction was strongly positive in 1 c.cm., 0·5 c.cm., 0·2 c.cm., and 0·1 c.cm. Lange's gold curve showed a luetic zone.





Photographs showing front and back views of the patient. The wasting of the right sternomastoid and trapezius muscles is well shown.

Progress.—The patient has been subjected to anti-syphilitic treatment and there has been considerable subjective improvement. He has gained weight and has now been free from lightning pains for over a year. The physical signs have, however, altered but little. The deviation of the tongue is now hardly noticeable, but the atrophy of the sternomastoid and trapezius is more pronounced than when he was first seen. His diet is still a fluid one, and the huskiness of his voice indicates the persistence of the laryngeal paralysis.

Discussion.

The diagnosis of tabes in this case has been based on the history of lightning pains, the pupil changes, and the serological findings, and is felt to be justified in spite of the absence of objective evidence of posterior root involvement. The marked affection of the cranial nerves stands out in contrast to the slightness of the other indications of the disease.

Judging from the scant reference to the glosso-pharyngeal nerve in the literature of tabes one is tempted to assume that it is practically immune to the encroachments of the disease. But if positive findings of glossopharyngeal damage are lacking from the case reports, negative ones are almost as conspicuously absent, and it seems not improbable that the apparent rarity of lesions of this nerve is at least partly due to the fact that such lesions are but seldom sought. Loss of appreciation of taste in the posterior third of the tongue is perhaps the most conclusive evidence of a glossopharyngeal lesion, but the majority of writers seem to have neglected the systematic investigation of the gustatory functions. Thus, though Grabower[1] found the glossopharyngeal nerves degenerated in his case of tabes with bulbar paralysis, he makes very little reference to the integrity or otherwise of the sense of taste during life. Pfeifer[2] investigated a tabetic showing marked bulbar signs with special reference to the taste function, and found that there was delayed appreciation of taste but that the sensation was nowhere completely lost. He reviewed all the previously reported cases of tabetic bulbar palsy and comments on the almost complete absence of adequate reference to taste.

Whatever doubts may be felt as to the rarity of lesions of the glossopharyngeal nerve in tabes, the infrequency of paralysis of the spinal accessory can hardly be gainsaid. Graeffner[3] has pointed out that some slight degree of atrophy of the sternomastoid and trapezius may not uncommonly be noted in tabetics, and he himself observed it in 25 out of 113 of his cases. Marked paralysis as seen in the present case is, however, an entirely distinct condition and I have only traced 14 examples in the literature. Of these, one only—namely, that of McBride,[4] has been reported in English. The ten cases, occurring prior to 1904, were collected and reviewed by Avdakoff,[5] who added an eleventh, while Davidson and Westheimer,[6] Souques and Chéné,[7] and Léri and Boudet,[8] have reported three further cases. The degree of palsy varies greatly from case to case. In some it is unilateral, in others bilateral; sometimes the trapezius is affected alone, sometimes the sternomastoid. It is interesting to note that the vagus has always been simultaneously affected. In all the cases save one the spinal accessory palsy has only attracted attention after the disease has become well established. The exception is one of Seiffer's[9] cases, where pain in the shoulder and difficulty in swallowing were almost the

earliest symptoms of the disease. In this patient, however, in addition to evidence of spinal accessory and vagus paralysis, the knee-jerks were found to be absent and ataxia rapidly supervened.

Paralysis of the vagus, though not common, is much less rare than that of either of the nerves just referred to, and case reports of tabetic bulbar paralysis in which the vagus has been predominantly affected are fairly numerous in the literature. Graeffner[3] found that minor lesions of the vagus were quite common; 54 cases out of 206 examined showed some degree of vocal cord weakness on laryngoscopic examination, indicating that the larynx is a *locus resistentiæ minoris* in tabes. The severer degrees of vagus palsy are always characterised by difficulty in swallowing.

Pathogenesis.

Any attempt to interpret the findings in terms of pathology is necessarily somewhat hazardous. The pathological process would appear to be fairly circumscribed and the evidence all points to its being peripheral rather than central in its action; a lesion of nerves or nerve roots, rather than of the bulb. None of the long tracts traversing the medulla has been demonstrably affected, and the normal movements of the diaphragm and other respiratory muscles negative any involvement of the respiratory centre, to which the central connexions of the vagus are so intimately related. Moreover, the impairment of the functions subserved by the nerves concerned has been very complete and, to produce such a marked effect, a medullary lesion would have to be so extensive as almost inevitably to involve the long tracts or the respiratory centre. The morbid process would appear, therefore, to be operative outside the medulla and—remembering that the characteristic lesion of the posterior roots has its origin where the latter pierce the dura—it is not unnatural to conclude that in the present case the glossopharyngeal, vagus, and spinal accessory nerves, and to a less extent the hypoglossal, have been primarily affected at the same site. The early separation of the hypoglossal nerve from its neighbours to pass through the anterior condyloid foramen would militate against placing the lesion further peripherally.

No case of tabes where the spinal accessory nerve has been involved has, so far as I am aware, come to autopsy, but the post-mortem findings in Grabower's[1] case are of interest, inasmuch as the glossopharyngeal and vagus nerves were affected, though the spinal accessory escaped. In this case there was slight meningeal thickening and a small cyst beneath one of the cerebellar hemispheres. Microscopical examination showed that, with the exception of degenerative changes in the fasciculus solitarius, the nuclei and central connexions of the vagus and glossopharyngeal were intact. On the other hand, the trunks of these nerves were almost completely degenerated. In view of the clinical findings in the present case it seems not unjustifiable to presume that the underlying pathological condition is of the same nature as that detailed by Grabower, and that the symptoms have been produced by degenerative changes in the nerves themselves and not by any injury to their centres in the medulla.

I gratefully acknowledge Prof. John Hay's permission to publish this case, which was under his care, and am indebted to Mr. H. V. Forster and to Dr. R. E. Roberts for allowing me to quote the laryngological and radiological reports.

Summary.

Unilateral paralysis of the glossopharyngeal, vagus, and spinal accessory nerves is described in an early case of tabes dorsalis. Evidence is put forward for regarding the paralysis as due to degeneration of the nerve roots rather than to disease of the corresponding nuclei in the medulla.

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1. Grabower, H.: Deut. Zeit. f. Nervenh., 1897, ix., 82.
2. Pfeifer, B.: Ibid., 1907, xxxiii., 246.

(*Continued at foot of next column.*)

Clinical and Laboratory Notes.

TREATMENT OF CHRONIC RHEUMATIC DISEASES WITH TRANSCUTAN BATHS.

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AND
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IN 1925 our attention was drawn to the transcutan treatment of chronic rheumatic diseases, and last year we decided on careful study of its action and results. The treatment aims at an optimal combination of several therapeutic agents often employed separately in the treatment of chronic rheumatic diseases. It is given in the form of baths, the preparation being added to the water.

Dose 1 contains 34 per cent. inorganic salts (calcium chloride, 80·5; magnesium chloride, 6·6; strontium chloride, 2·1; potassium chloride, 5·1; sodium chloride, 2·6; potassium bromide, 2·3; and lithium chloride, 1·1); 17 per cent. essential oils (turpentine, oil of wintergreen, bornyl acetate); 1 per cent camphor; and 48 per cent. water.

Dose 2 contains 28·4 per cent. inorganic salts (of the same composition as above); 31 per cent. essential oils; 2 per cent. camphor; 39·5 water.

The beneficial effect of brine baths upon chronic rheumatic conditions has long been established. The influence of these baths on the body is probably: (1) by a thermal action, and (2) by the absorption of chemical substances (ions) through the capillaries of the skin.

According to Ryszkiewicz[1] the constituents of the essential oils have some sensitising effect upon the cells of the body. This sensitisation has been compared with the effect of the shock produced by the parenteral administration of protein showing itself in rise of temperature, leucocytosis, and focal reactions.

Method and Results.

The patient is placed into a bath of 36° C. (96° F.), to which, within ten minutes, hot water is gradually added up to a temperature of 39°–41° C. (102°–106° F.). Then the contents of one bottle of transcutan are poured over the surface of the water and distribute themselves uniformly without being stirred. The patient should stay in the bath for another ten minutes. After the bath he is wrapped in a big bath towel and not dried. He is put into bed, where an intense perspiration sets in which lasts for about two hours. During this stage his face should occasionally be dried and a cold compress applied to the forehead. After this sweating he is well rubbed down and has to rest in bed for another six hours. Sensitive parts of the skin, such as the anus and scrotum, should be protected by the application of some vaseline before the patient enters the bath.

The number of baths given in individual cases must be judged by the condition of the patient, and mostly depends on the chronicity of the case. More than ten are rarely necessary. In patients bearing the treatment well a bath can be given every other day. There are two strengths of transcutan baths, and the first one or two baths should begin with strength I. Unpleasant symptoms which the patient may experience at the beginning of the treatment are palpitations, which can easily be relieved by bromide, and increase of pain in the affected parts.

[1] Ryszkiewicz, A.: Zeit. f. Bäderk, 1929, iv., 324.

DR. R. W. BROOKFIELD: *References.*

(*Continued from previous column.*)

3. Graeffner: Münch. med. Woch., 1907, liv., 1775.
4. McBride, P.: Edin. Med. Jour., 1885, xxxi., 12.
5. Avdakoff, A.: Thèse de Paris, 1906.
6. Davidsohn, E., and Westheimer, B.: Deut. med. Woch., 1904, xxx., 1712.
7. Souques and Chéné, H.: Rev. Neurol., 1909, xvii., 249.
8. Léri, A., and Boudet, G.: Ibid., 1910, xix., 561.
9. Seiffer, W.: Berl. klin. Woch., 1903, xl., 940.

Even elderly patients bear the treatment well, and in cases of hyperpiesia the blood pressure has been noted to fall. Indications for the treatment are: neuritis, especially sciatica, muscular rheumatism (fibrositis), subacute polyarthritis (septic foci should, of course, be dealt with), gout, osteo-arthritis without gross deformities, and joint destructions. Diseases of the skin and disturbances of the circulatory system are contra-indications.

We have treated about 40 cases in the last year. These cases came from our out-patient department and were taken into hospital for this treatment. About ten were private patients who took the baths at home under medical supervision. Most of these patients had been known to us for some considerable time, and all modern methods of routine treatment were tried before the transcutan baths. The number of baths given varied from 2 to 12. No other remedies were employed during the treatment.

Of nine cases of sciatica, seven were cured and two much improved. Of ten cases of fibrositis, eight were cured and one much improved; one, who showed a marked neurotic element, did not respond to treatment. Of 16 cases of subacute arthritis, ten were cured and six much improved. Of five cases of osteo-arthritis all were much improved as regards periarticular swelling, pain, and motility. One case of gout was much improved. We give a few examples.

A man, aged 43, who had had severe sciatica for several years and was walking on crutches, had had all methods of treatment before including intraneural injections. He left hospital after ten baths walking perfectly normally.

A woman, aged 50, known to us for two years, had severe bilateral sciatica, getting worse in spite of all treatment, and for the last few months was only able to walk stooping at almost a right angle. Transcutan treatment was given as a last resource and without much hope. The improvement after twelve baths can only be described as dramatic. The patient left the hospital walking straight with very little discomfort.

A man, aged 33, had recurrent attacks of lumbago after exposure to cold. A severe attack was absolutely checked by two baths.

A woman, aged 39, had severe pains in the muscles of her back and shoulders for a month, and was unable to lift her arms above the horizontal; she was cured and able to do her hair after three baths.

A woman, aged 31, with periarticular swelling of several joints, most marked in the left knee, and occasionally a subfebrile temperature, was discharged without pain and swelling after six baths.

A woman, aged 59, with marked osteo-arthritis with deformities, hardly able to walk, tried the treatment at her own request. Striking improvement as regards pain, periarticular swelling, and movements was obtained after eight baths.

A woman, aged 57, with typical gout, had no pain or swelling after nine baths.

Among our cases we have only had four relapses within several months; these could be attributed to exposure to damp. The symptoms were very slight and could readily be checked by a few baths. Like other authors, we have found that patients with a pronounced neurotic element did not respond to the treatment as well as the others, especially as regards pain. On consideration of our results we are convinced that the transcutan treatment is the most effective remedy in chronic rheumatic disorders we have come across.

We should like to express our thanks to Dr. F. Parkes Weber for permission to include his cases in our publication.

A DECEPTIVE X RAY SHADOW

DUE TO A TUMOUR OF THE SKIN.

BY ROBERT COOKE, M.B. BRIST., F.R.C.S. ENG.,
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IN January last a patient was referred to the out-patient department as a likely case of renal calculus. Examination indicated a traumatic muscular lesion, but a radiogram of the urinary tract was taken. A dark shadow with very sharp margins showed in the renal region on the injured side. It was reported as probably being a renal calculus. Re-examination made me more than ever convinced of the muscular cause of the symptoms, and suspicion fell upon a very soft, pedunculated tumour (the size of a cherry) which had been noticed on the skin of the back in the right loin. The tumour was removed and further skiagrams (both antero-posterior and lateral) showed no shadow. Had there been a renal calculus the shadow would almost certainly have been superimposed on that of a vertebral body in the lateral view.

Unfortunately the little tumour was lost in transit to the pathological department, so that histological section (and subsequent X ray) was not made. It would seem to have been a simple pedunculated lipoma without any palpable trace of calcification.

Similar cases have been recorded before, but this case seemed worth reporting, for it may serve to remind us of the fact that simple skin tumours—with or without any calcification—may cast radiographic shadows which may lead to an error in diagnosis. The factors governing the density of the shadows caused by these tumours seem to be their relative nearness to the film, and the amount of air surrounding them. A short while after this experience, I read of a similar case reported by Delzell. In this instance a simple skin tumour was suspected only after a fruitless search for a stone had been made in a perfectly normal kidney.

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Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF SURGERY: PROVINCIAL MEETING.

AT a meeting held by invitation in Birmingham on June 4th about 50 Fellows were present.

Afternoon Operating Sessions.

At the Queen's Hospital Prof. W. Billington performed nephropexy, removing the appendix through the same incision, and an interval appendicectomy—both under percain spinal anæsthesia given by Dr. Kirby Thomas. Mr. Bernard J. Ward did a prostatectomy by the open method and a partial cystectomy for growth. He also showed cases in his wards of: (1) simultaneous transplantation of both ureters into the rectum for carcinoma of the bladder; (2) transvesical seminal vesiculectomy for melanotic sarcoma.

At the General Hospital Mr. Seymour Barling did a partial thyroidectomy for second-stage exophthalmic goitre. Mr. H. H. Sampson performed nephrolithotomy. Mr. Percival Mills had intended to do an excision of the colon for carcinoma, but finding the growth too far advanced did ileo-sigmoidostomy. Mr. James Leather performed cholecystectomy in a case where, although no calculi were present, cholecystography showed no filling at the end of 12 and 18 hours. There were adhesions around the gall-bladder.

Clinical and Pathological Session at the Institute.

Cases and specimens were demonstrated at the Medical Institute by the Birmingham surgeons,

followed by a meeting at which Sir HOLBURT WARING, the President, took the chair.—Prof. BILLINGTON, after extending a cordial welcome to the visiting surgeons, showed four cases of Syme's amputation for senile gangrene, the operation having been preceded by *peri-arterial sympathectomy*. For 30 years he had taught the futility of Syme's amputation in such cases, but preliminary sympathectomy had altered his opinion; it cured the pain and the amputation stump was perfectly nourished. Even if a Syme was not indicated in such cases, a much lower amputation was now possible than was previously the case.—The PRESIDENT suggested that, apart from the good results obtained, it was better to amputate about seven inches below the head of the tibia, in view of the greater ease in fitting an artificial limb.

Mr. WARD showed a case in which he had performed a complete cystectomy for bladder growth five years ago; the patient was now in good health.

Mr. SAMPSON showed a case of *œsophagoplasty* in a girl with severe stricture of the œsophagus following caustic soda burns. For some time attempts had been made to dilate with bougies with the result that a perforation of the œsophagus into a bronchus was present when the case came under his care. The operation was performed in several stages; gastrostomy and then a length of jejunum was isolated. A tube of skin was infolded from the presternal area, and the side flaps freed and stitched across; the sex of the patient made this easier, owing to the loose submammary tissue. The œsophagus was then exposed in the neck and the lower end of the upper part transplanted to make junction with the skin tube over the left sternoclavicular joint. A fistula was expected from the free end of the œsophagus, but this had closed firmly. The loop of jejunum was then joined to the lower end of the skin tube, and the other end inserted into the stomach. Mr. Sampson stressed the importance of choosing a loop of jejunum with a good artery in the centre of its mesentery. All scars were now well healed, including the gastrostomy, and the patient was leading a normal working life. He acknowledged his indebtedness for some of his ideas to Professor Zaaij, of Holland, whose case of a porter with a similar condition had come under his notice.

Mr. BARLING, in presenting some cases of bronchiectasis after *phrenic avulsion*, spoke of the increased readiness of physicians to hand such difficult cases to the surgeon. While the benefit of the minor operation only was very marked, he thought that phrenic avulsion should be followed by cauterisation at a latter date.—Mr. BERTRAM LLOYD described and showed the results of cauterisation in similar cases. He laid stress on the low operative risk, and advocated the use of a large soldering iron. He uses the ordinary plumber's type, heated to dull black in an electric oven, which retained the heat for 15 minutes.—Mr. HUNTER agreed that phrenic avulsion in itself greatly improved the condition of the patient. He pointed out that after injection with lipiodol the radiogram in such cases showed two types: one in which the dilatation of the bronchioles was in grape-like formation, and the other which he described as the fingers of a glove, hanging downwards.

Mr. BARON T. ROSE exhibited several cases of *carcinoma of the mouth and tongue, treated with radium*. While the toilet of the mouth was of importance, it should not, he said, be carried too far, as the reaction following wholesale extraction militated against the efficient action of radium. Merely scaling, extraction of one or two really bad stumps with ordinary cleanliness, had proved to be better. Objection had often been expressed to mechanical applicators when interstitial insertion of radium needles was difficult, but he had found them of great assistance to him. He advocated the exhibition of radium around the primary focus before clearing the glands, as a good vascular and lymphatic supply was essential to good local results. It was unnecessary to remove the sternomastoid during the block dissection of the glands.—Mr. PERRIN agreed with the latter statement, a thorough clearance of the anterior triangle being sufficient.

Mr. C. A. RAISON showed a case of extensive *lymphangioma* of the face which had been seen by him for the first time four years ago, when treatment by injections of alcohol, boiling water, iodine, &c., had already been tried, with almost no improvement, and the patient had returned with much extension of the lesion. He had recently treated the upper part of the face with radium, with marked improvement, and intended now to continue using radium with hope of an eventual cure.—The PRESIDENT spoke of the hopelessness of such cases under treatment by excision.

Mr. F. A. R. STAMMERS showed a good result of *lumbar sympathectomy* in a case of thrombophlebitis obliterans with intermittent claudication. He pointed out the advantages of this procedure over arterial sympathectomy, in that the whole of the sympathetic supply to the limb was cut. If a long series of cases was taken, it would be found that the good results of sympathectomy were transitory, frequently lasting only six weeks. The simpler operation, however, was of value in such conditions as ununited fractures, traumatic tuberculous joint, and varicose ulcers.—Mr. PERRIN spoke of several cases of thrombo-angeitis obliterans in which the lesser operation had given much benefit.—Prof. BILLINGTON said that in his case of Syme's amputation after preliminary arterial sympathectomy the amputation was performed two years after the first operation. The stump was healthy and sound, indicating that benefit had lasted much longer than six weeks.

Mr. J. F. BRAILSFORD demonstrated several cases of *lumbosacral deformities*. A case of spondylolisthesis associated with spina bifida led him to suggest that all such cases were of congenital origin, and not traumatic. A condition which he ventured to call chondro-osteodystrophy, in a boy of three years and nine months, was of interest, in that the radiograms showed a condition similar to Perthes's disease in every joint. This was associated with dislocation of the lumbo-sacral vertebræ, large joint spaces, carious teeth, and double inguinal hernia. Daily administration of cod-liver oil, and the use of a posterior spinal support for three years had not improved the condition.

The architect's plans of the new Birmingham Hospital Centre were on view, and excited much interest.

ASTHMA RESEARCH COUNCIL.

SCIENTIFIC MEETING.

A SCIENTIFIC meeting of this council was held on June 5th, the chair being taken by Dr. A. F. HURST.

Prof. R. J. S. MCDOWALL spoke on the

Physiological Aspects of Asthma.

He said that a large amount of what had been written by clinicians was true; they had actually cured asthma in the past. The physiologists had to inquire why the nasal element was important in asthma but was not the only element. General metabolism must be investigated. There was something wrong with protein metabolism in asthma; this might be due to disorders of digestion or of metabolism proper, and these disorders linked on to the psychological aspect of asthma through the phenomena of anaphylaxis. When foreign protein entered the body the autonomic nervous system showed greatly enhanced irritability. The vagus could be set in operation by many mechanisms not yet understood. The eosinophilia of asthma had not yet been fitted into any scheme, but all the various aspects of the problem were being attacked by different workers, and their combined work made a coherent research.

Heredity.

Dr. G. BRAY said that the hereditary factor was the most prominent feature in allergy in two-thirds

of the 200 children he had studied at Great Ormond-street, though the manifestation of the allergy was not always asthma. Sensitivity was found in both parents in 50 per cent. of the cases and on one side in 20 per cent. Of the latter, it was twice as often on the mother's side as the father's. The precipitating factor might depend on environment, mental or endocrine disturbances, alimentary dysfunction, or physical conditions. Males tended to improve and females to get worse towards puberty. The earlier the symptoms of sensitivity appeared the more likely were they to be multiple. Those with history of allergy on both sides had always developed their symptoms before the age of 10. A child born in a family with pure asthma lineage was much more likely to be affected with asthma than other forms of allergy, but even in the same family the symptoms varied.

The CHAIRMAN pointed out the prophylactic importance of the hereditary factor and the frequency with which the early symptoms of asthma were misinterpreted in children. It was curiously rare for any high proportion of children in a family to have hereditary asthma.—Dr. JOHN FREEMAN thought that the hereditary chart depended considerably on the number of intelligent relatives available. With a wider field the figures would be larger. He thought that heredity and determining tissue damage went together.—Dr. JAMES ADAM said that heredity was smothered by nurture. His heredity figure for 1120 patients was 25 per cent.—Dr. BRAY said that 50 per cent. of his patients were "only" children, and most of the others were the eldest of families in which the next child was still a baby. In adults the family history was usually lost.

Types of Asthma and Age of Onset.

Mr. F. COKE spoke of the importance of recognising different types of asthma, which was merely a symptom after all. The differences were fundamental, both for treatment and pathology. Four quite distinct types were: (1) when the asthma directly followed some chest trouble and was usually associated with a patch of congestion at one base; this was usually cleared up by a vaccine; (2) when the trouble started as a dry spasmodic asthma, and the patient was quite well between attacks; (3) a colloido-clasic type, occurring almost always in plump middle-aged women with beautiful skins, paroxysmal rhinitis, and scanty, painful menstruation; (4) an aspirin-sensitive type, with clear-cut symptoms, and invariably associated with nasal polypi.

Dr. L. J. WITTS said that where the constitutional predisposition was very strong there was a tendency to early onset and associated allergic symptoms. In children asthma was a much more general disturbance than in adults, and dyspnœa might not be the most outstanding feature. In adults the paroxysms were shorter, sharper, and more easily provoked, and the patient was never quite well in between. The response to glucose was very good in children under 10, and diminished as years increased.

Dr. HURST remarked that some of the worst cases had polypi; removal made the condition worse, but if the underlying ethmoiditis were dealt with cure usually took place. The belief that cure would follow vaccines or removal from the proximity of the specific protein was optimistic; some substitute condition would usually be developed. It was necessary to treat the central predisposing condition. This was the factor which was attacked by glucose.

Digestion and Asthma.

Dr. BRAY showed graphs illustrating the subnormal secretion of gastric acid and chlorides and delayed emptying in a high proportion of 100 asthmatic children. There was often a good deal of mucus, and bile was completely absent. Twelve of the children had no acid at all, and 45 had less than 10 units; in normal children few or none had no free acid, and of 50 rheumatic convalescents only 20 per cent. had less than 20 units. The deficiency seemed to be an innate quality; it appeared in hay-fever, eczema, and prurigo, but less in hay-fever. Treatment by acid was giving encouraging results, especially in rapid return of appetite and weight. Very young hereditary cases responded better than older ones.

Dr. F. T. HARRINGTON said that much of the mystery and difficulty in asthma were due to not beginning at the beginning; the treatment of dyspepsia in asthma often cured and never did any harm. The layman knew practically nothing of dietetics. The patients should always be allowed to give their own theories; they often provided the key. Very often they related discomfort after food or put the connexion more vividly still. Vomiting would cure an attack and the appetite often failed after an attack. The work of McDonagh on protein particles deserved attention. Allergy could often be reduced if digestion was improved. Inflammation of the nose was a result of digestive disturbance, but some asthmatics had no trace of ethmoiditis. Nasal and bronchial catarrh cleared up under digestive treatment. A distended stomach impeded movement of the diaphragm and thus mechanically produced bronchial spasm. Milk did more harm than any one other factor; no other animal took milk after weaning. It produced a sodden, catarrhal nasal mucosa. Constipation should be treated by rational diet rather than purges.

The CHAIRMAN said that in 24 of 40 adult cases the test-meal had shown normal acid. He hoped it would be possible to make patients secrete their own acid, without having to administer hydrochloric acid. Asthma was very often due to poisons swallowed from defective nose, teeth, or tonsils, and attention to these would cure the paroxysms. The stomach should be washed clear of mucus every morning to restore the mucous membrane.

Dr. E. P. POULTON mentioned another adult case of asthma with normal acid secretion, and one in a child where the acid had been very low at one test-meal and slightly above normal in a second, without any treatment.—Dr. ADAM said that in the majority of his cases there was hypochlorhydria, and ascribed it to defective diet combined with lack of exercise. It was one manifestation of defective ferment action throughout the body due to unsatisfactory hygiene.—Dr. BRAY said he had done repeated test-meals and found no differences.

Dr. JOHN FREEMAN described work associating urticarias and angioneurotic œdemas with infection of the gall-bladder. The cultures were difficult to grow, and the streptococci did not appear in the stools. Sensitive patients had been tested with house dust and with the solid residue resulting from evaporating tap water and dialysing off the concentrated salts. Work on mould spores had had to stop, as the mycologists themselves had not enough knowledge of moulds to help. A series of test-meals had shown that free acid was greatly diminished in sensitive patients. He concluded, from an experiment with the Prausnitz reaction, that the substance which entered the blood through the intestine and was specific for the offending protein was non-dialysable. One good meal discharged the sensitisation artificially induced in a normal subject.

Urinary Proteose.

Dr. G. H. ORIEL described experiments on urinary proteose, which was identical with the albumose long known in the urine of patients with acute infections. It was present in normal urine but increased enormously during an attack of any allergic condition. It was toxic to animals. In doses somewhat smaller than a skin-test dose it benefited some patients; an overdose caused an attack. It probably originated in the gut as a result of faulty digestion. The four methods of treatment were specific, dietary, and the administration of acid and glucose.

Dr. H. W. BARBER spoke on the clinical results of proteose treatment, which must be regarded as specific. It was the only effective treatment for urticaria and

angioneurotic œdema, which responded well; it was strikingly successful in dermatitis herpetiformis. Cases of light sensitisation, being extremely susceptible, were made worse, but some prurigos did very well, and children with Besnier's prurigo did better than adults. Uncomplicated psoriasis was little influenced, but when it was combined with rheumatoid arthritis both conditions were improved. The method was valuable when the offending substance was unknown.

Dr. POULTON said that he had produced a typical rheumatoid arthritis reaction with proteose from a case of that disease in a patient with fibrositis.—Dr. FREEMAN likened proteose to the "histamine-like" substance discovered by Thomas Lewis in cases of dermatographia.—Dr. BARBER answered that the active principle of proteose was an antigen more like Mainwaring's anaphylatoxin, produced by a primary action on the sensitised liver-cell; it was not histamine, though it acted like histamine on plain musculature.—Dr. BRAY mentioned American work, showing the presence of proteose in the gastric mucus; the action was intensified by achlorhydria and delayed by normal or excessive acid.—In answer to a question, Dr. BARBER said that the proteose was probably not identical with the soluble substance produced in infectious conditions.

Sinusitis.

Mr. C. GILL-CAREY distinguished two types of sinusitis in asthma: suppuration limited to one or two sinuses, which responded well to rhinological treatment, and a generalised thickening of the lining membrane, which perhaps should not be called sinusitis at all, as it was probably not due to bacteria originally. The second group were difficult to treat; radical surgery was not justified by the results, but local silver preparations were sometimes helpful.

Dr. BRAY asked whether the condition was the cause or an effect of allergy. The pus was sometimes not neutrophil but eosinophil.—Mr. GILL-CAREY said he regarded it as an effect.

Eosinophilia.

Miss MARJORIE GILLESPIE described research into the variations in the eosinophil count. In asthma patients it hardly ever dropped below 4 per cent., and the highest recorded was 57 per cent. in a man who was having no attacks. The average was between 7 and 10 per cent. During the attack the percentage fell to one-half. It rose considerably during the menstrual period and in pyrexia. Detoxication caused no variation. Adrenalin reduced the count; urea raised it and caused acute symptoms; large doses of sodium bicarbonate did not alter it. It bore no relationship to the alkali reserve; it rose with the blood amino-acid content, but not relatively.

Dr. BRAY criticised the percentage count as being misleading; the total number was lower than normal in attacks but the percentage might rise because of the general shortage of lymphocytes in the attacks. In normal children the percentage was 2 of 10,000; in asthmatics it was 3, but of 15,000 or 18,000.

Dr. F. A. KNOTT described the examination of sputum plugs for eosinophil cells. A large number contained no bacteria, and when organisms were present they were generally Gram-negative. Eosinophilia in the sputum pointed definitely to eosinophilia in the blood. His figures agreed with Dr. Gillespie's. About a half of the cultures produced a wheal in a non-sensitive person and contained histamine, the production of which locally by a specific small-tube infection might be one slight cause of the asthmatic state. Over half the specimens of fæces showed undigested residues of some kind. They mostly came from small children of the achyliac type described by Dr. Bray, and tended to contain late-lactose-fermenting bacilli, supposed to be proteolytic but giving no skin reaction.—Dr. HURST remarked that the treatment in these cases should be dietetic; desensitisation was useless.

Dr. HARRINGTON outlined treatment by diastolisation, and described and showed the inflatable rubber bougies in use and the apparatus by which ease in breathing was tested.

Dr. HURST asked his opinion on lavage with carbon dioxide, which could be bought in small cylinders and had given good results in his own nasal catarrh; Dr. Harrington agreed that it was a useful palliative.

At the meeting of the Medical Advisory Committee it was decided to form an asthma research club for free private discussion of problems and results. Dr. Freeman consented to act as secretary.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.

THE quarterly meeting was held at the house of the British Medical Association on May 22nd, Dr. NATHAN RAW, the President, being in the chair.

PSYCHIATRY IN AMERICA.

A discussion on American psychiatry and any practical bearing it might have in the application of recent local government and mental treatment legislation was opened by Dr. A. A. W. PETRIE (Banstead), who gave an account of a recent visit to American general and mental hospitals, psychiatric clinics, reception units, observation wards, and mental deficiency institutions, as well as mental hygiene centres and various forms of child guidance organisations and the associated nursery schools. Observations were also made of psychiatric work in connexion with juvenile courts. Dr. Petrie had visited Montreal, Toronto, Chicago and vicinity, Boston, Worcester, Wrentham, Washington, Baltimore, Philadelphia, Yale University, and New York City and State. Each State had its own method of dealing with the problems involved.

In the progressive Eastern States it was usual, he said, for the mental hospital service to be a subsection of the State welfare services under a medical commissioner. Concentration of executive authority in the State rendered progressive development easier, and it was more possible to obtain legislative and other changes. In New York and New England well organised State social services were being developed. The larger unit provided by the State allowed in America a coördination of activities not possible in smaller units. New York State, for instance, dealt with over 63,000 patients who are drawn from a population of 44,000,000. The recent Local Government Amendment Act, however, did make one authority in an administrative area responsible for the treatment of the earliest stages of mental disorder, and therefore it was hoped that well coördinated and efficient reception hospitals would take the place of the present wasteful division into observation wards of doubtful efficiency. He expressed the further hope that the Mental Treatment Bill, when it became law, would allow of the development of voluntary clinics on the same lines as in the Maudsley Hospital and the famous Phipps Clinic in Baltimore. The latter was greatly under the dominating personality of Dr. Adolph Meyer. It consisted of 60 beds and an out-patient department, and education and research were prominent features. Notable also was the clinic at Philadelphia, a hospital somewhat resembling Bethlem in London. It had decided to take a place in the country for certified cases of longer duration, and leave in the city a clinic for out-patients. The psychiatric institute which had been established in New York in connexion with the medical unit of the Columbia University would be one of the most notable in the world. Reception hospitals were increasing in number, which was one of the most hopeful signs in the United States.

Dr. Petrie doubted whether such clinics and reception hospitals should be an actual part of the

hospital to which they were attached. The out-patient department at the Boston Psychopathic Hospital, which was the clearing-house for Boston area, attracted as many patients as the corresponding out-patient department at Boston General Hospital. In the event of noisy patients having to be taken, double windows were provided. The work of these reception units was largely determined by the source of the admissions. In the Chicago Clinic, with its 175 beds, about 100 beds had to be cleared weekly in order to deal with the probable new admissions. Dr. Petrie usually found that these units had not sufficient staffs to deal with the great amount of material passed through them. A unit with 600 beds was being projected in New York. The chronic patients in the large State hospital in America were not any better dealt with, in Dr. Petrie's opinion, than this class were in England, and in the former country overcrowding prevailed at many places. Much difference of opinion existed in America as to what was the best size of mental hospital. In Massachusetts, a very progressive State, 2000 patients was the usual limit. He found in the States a similar tendency to that in England to modernise old hospitals by building new and up-to-date units for the newer mental patients, and infirmary blocks or hospitals for those suffering from physical diseases. He also saw in America good examples of the villa or colony hospitals.

The consultant medical staff of American State Hospitals were, said Dr. Petrie, usually appointed on a liberal scale. In the progressive States the house medical staff was in larger proportion to the patients than in England; in Massachusetts there was one assistant physician to each 150 patients. And a most useful appointment which was common in the States was that of clinical director or clinical psychiatrist, who was placed equal in rank with the deputy medical superintendent and the pathologist. He directed and coördinated treatment, and was usually a teacher in a medical school. The laboratory facilities were similar to those in England, but one frequently saw a more elaborate equipment. A further aspect was that lectures to psychological and theological students and social workers in general were encouraged in the States. Much could be done in this way to break down the prejudice and mystery which were generally associated with mental hospital work. A sharp division existed between nurses and attendants, based upon the preliminary education required. Attendants had no special training. The line of cleavage would become more marked in the future when a complete secondary education for the nurses was demanded.

Occupational therapy, Dr. Petrie considered, was more broadly developed in the States than in this country. At St. Elizabeth's, Washington, for 4000 patients, 16 occupational therapy officers were engaged. The hospital farms tended to be larger than here. Canning of meat was commonly seen. Hydrotherapeutics was well organised, and hot baths and packs were usually employed, sometimes under conditions which in this country would be termed "restraint." Electrical treatment plant installations were generally of a high standard. Diathermy and other high-frequency apparatus was frequently seen and often used to induce high temperature in the treatment of general paralysis. Ultra-violet and infra-red light rays were in general use, and it was common to see automatic recording apparatus in connexion with bath treatment and blood pressure.

Out-patient departments for mental cases were usually run in connexion with the State hospitals. This certainly kept the medical staff in touch with the early phases of the disease. It was considered an advantage that the granting of trial or discharge should be vested in the medical superintendent, such decision being assisted by staff conferences at which the patients were examined. The terms of commitment, he said, varied in the different States, but, on the whole, were not very different from those obtaining in England. Temporary observation was permitted for from 10 to 30 days. Several States permitted voluntary admissions, but owing to the overcrowded condition of the mental hospitals few were received on this basis in the State hospitals. The cafeteria (self-service) system (which he described in some detail) was worth consideration, as there was a minimum of waste from it. Still, he did not think that even the advantages of the system would justify the cost of initiating it in this country. An interesting development was the wide establishment of beauty parlours and hairdressers' shops in State hospitals. They did not cost a great deal and did much to improve the appearance and increase the self-respect of the patients. Another pleasing feature was the combined canteen and club rooms which were provided for the patients on parole. The cost per patient per week in the States averaged about 35*s*. In Canada it was rather less, in New York a little higher.

Dr. Petrie was favourably impressed with the mental defective "schools" which he inspected at Wrentham and Letchworth. To a great extent the institutions trained their own people as there were not many trained teachers available for the work. Child guidance, nursery schools, and parent guidance were comparatively new features, and all these agencies had a psychiatrist who acted as director. Sometimes a children's physician, a social worker, and one who specialised in recreation were added.

This work had been started in association with juvenile delinquency. The mental hygiene movement had done much to stir and educate public opinion in the States, and one reason progress was being made was that the professions and laity in the States were being educated to take a more reasonable attitude towards mental illness.

Dr. J. R. LORD (Horton) said his visit to the States to attend the World's Mental Hygiene Congress was a short but intensive one. He had been enlightened on many subjects and disillusioned on a number of others. The medical profession in America was not, he said, anything like as unanimous on the value of sterilisation as was thought. The layman, however, had taken up the subject keenly. An important discussion took place at the Congress on the organisation of the mental hospital in the mental hygiene service. Dr. Lord expressed his own view that if care were not taken there was a danger that psychiatry might again become a closed system, and revert to a position of isolation. There should rather be a psychiatrisation of all medical and social services, leaving to psychiatry the care and treatment of actual mental disorders from their earliest stages. The magnitude of the problem of the mentally afflicted in the United States was much greater than in England. The rate per 100,000 of the general population in America for first admissions to mental institutions of all kinds was 76·0; in England and Wales it was 45·4. In America 277·7 per 100,000 of the population were in mental institutions; in this country 290·6. To the American figure for comparative purposes must be added 24·0 for parole cases, giving a total figure for that country of 301·4. But this was not the whole story. American State institutions were for the most part shockingly overcrowded, even up to 50 per cent. of their accommodation.

State control of mental institutions had been commented upon favourably, but Dr. Lord could not help thinking that such a state of affairs would not have been tolerated if the responsibility for providing the accommodation had lain with local authorities. He had always laid it down that the more closely local people were identified with the care and treatment of their mentally afflicted and defective, the sooner ignorance and prejudice regarding them would be dispersed and the need for judicial intervention reduced to minimum requirements. It was for the State to lay down great principles and advise how they should be carried out, reserving to itself a veto when such principles were disregarded. One

thing appeared to him to be certain, and it was that America had no intention of solving its psychiatric problems by bricks and mortar alone. Child guidance and welfare work of all kinds organised for the prevention and early treatment of mental disorders; eugenic measures and parental education were to have the drive of the State dollars for the future—hence the reluctance to increase the State hospital accommodation. America had also lessons for us in the importance it attached to the psychiatric education of medical men, social workers, occupational therapists, and others in the field of public welfare. Research work, too, was more widely developed and received greater support and encouragement both from the State and private citizens than in this country.

Touching on legal matters, Dr. Lord said that as regards the mental services (and certainly not if the Mental Treatment Bill became law) America had little or nothing to teach us except perhaps in respect of recent enactments in one or two of the more progressive States, and also in the way in which patients are allowed out on leave or discharged. Although many State hospitals and municipal clinics could admit voluntary patients (the state of mind qualifying for such seemed to him almost to exclude any aberration) this departure did not receive much encouragement from the hospital authorities judging by conversations he had had with many superintendents from all over the States. The modern practice was admission on two medical certificates sworn before a judge or magistrate. This is thought to be the wisest course in non-litigious cases, to avoid future complications. In some of the States patients, litigious or not, could be detained for from 5 to 30 days on two medical certificates, unsworn or, if a court order was required and did not accompany the patient, on notification, the judge or magistrate issued a temporary commitment order and fixed a date for the "hearing." If the patient or his friends demanded it they could be present at a "hearing"; if no such demand were made the judge confirmed the order. The "hearing" might be within 5 to 30 days if, in the meantime, the patient had not been discharged or been classified as a voluntary patient. Such court orders were always necessary in litigious cases after 5–30 days, but not always before this time. Objectionable forms of judicial intervention still existed, but America did not seem to mind. A period of temporary treatment for 12 months without any judicial intervention as proposed under our Mental Treatment Bill was, generally speaking, unthinkable in America. Only in Maryland had the law on commitments been much relaxed. As in England it was the hospital in America comparable with our registered hospital which received a majority of voluntary admissions. He hoped that our experience under the Mental Treatment Bill would not, as regards voluntary admissions to public hospitals, be the same as in America. He felt sure it would not if Clauses I.–IV. were properly administered by the local authorities.

Other speakers followed, mainly seeking explanations or further information.

A RADIOLOGICAL INSTALLATION.—At the quarterly court of governors of the London Hospital last week, Lord Knutsford reported that about £5000 is being spent upon the installation of new apparatus for radiography and for treatment by rays of very short wavelength.

HULL ROYAL INFIRMARY.—The work of this institution last year constituted a record. There were 4227 in-patients, 15,801 out-patients, and 23,938 casualties—a total of 15,000 more than were treated as recently as 1919. The average in-patient stay was 20·66 days, compared with 22·04 in 1928. The annexe at Sutton is expected to be completed before the end of the year.

Reviews and Notices of Books.

DISEASES OF THE SKIN.

Treatment in Detail. By NOXON TOOMEY, M.D., late Instructor in Dermatology, University of St. Louis. St. Louis, U.S.A.: Lister Medical Press. 1930. Pp. 512. $7.50.

THIS is the third volume of a series of which Pathology and Diagnosis form the other sections. It will doubtless make a wide appeal, for in the treatment of diseases of the skin there is more divergence of method and less tendency towards standardisation than in any other branch of medicine. The experienced dermatologist will approve the classification and general plan of the book, the casual reader its simple, almost colloquial style. There are no tiresome introductory sections on the theoretical principles concerned either with internal medication or local applications. These are adequately discussed under the various diseases where necessary, and the author proceeds directly to his purpose from his first section which is on eczema. The briefest study of this section makes it apparent that the author is a master of technique in therapy, and has personally supervised every detail of the measures advocated under the various headings. As he himself remarks, "there is no cutaneous disease in which therapeutic skill is better brought out than in eczema." All the formulæ given are easily memorised and have the support of years of universal experience behind them. The author wisely abstains from offering too many alternatives. He names no sources of information, and in this respect, too, he is wise, for it is obviously gathered directly or indirectly from the records of all nations. A word of caution seems necessary. The book is not an elementary treatise on the therapeutics of skin diseases, and can only be used with advantage when a wide experience in diagnosis and pathology has been gained. With so much that is modern and universally accepted, it is disturbing to find that the author still advocates the use of X rays in certain stages of the treatment of lupus vulgaris; the appalling sequelæ which many dermatologists in this country and abroad are frequently called upon to treat have led to an almost complete abandonment of radiotherapy for lupus in expert European circles, where reliance is placed upon actinic and certain caustic applications. The treatment of dermatitis repens, which has been known in this country since the days of Radcliffe Crocker, is considered in a new and interesting light, and the method advocated seems applicable to other dermatoses of a chronic and resistant character. There is a good index, and the paper and printing are of excellent quality.

The book is likely to find its way into all dermatological libraries both public and private. It makes good reading, and is compact with stimulating information.

MODERN SUNLIGHT.

By LEONARD V. DODDS. London: John Murray. 1930. Pp. 322. 7*s.* 6*d.*

As Sir Oliver Lodge states in his preface, this book deals fully with medical opinions on the subject, and is put together in simple and readable form. Technicalities are avoided since the book is written for the general reader, but, on the whole, the information offered is remarkably accurate. There are a few statements which the medical reader will criticise. For example, we doubt whether the earlier detection of a scarlet fever rash by the use of daylight lamps in fever hospitals would be a valuable asset in saving life, but it might certainly play a part in limiting spread of infection. It is unfortunate that in a book meant for the lay reader the impression should be given that helio- and actino-therapy have rendered any form of surgical interference unnecessary in surgical tuberculosis. The book is of interest in the support

it gives to the value of actinotherapy, which has been seriously questioned or alternatively attributed to psychological effects. Abstracts of recent veterinary work show that breeders and trainers give light treatment regularly to both horses and greyhounds, and the opinion is expressed that such treatment has introduced a new factor in the calculation of racing-odds. The experience is quoted of workers at the Rowett Research Institute, who found that irradiation of cows increases the period of maximum yield and safeguards the health of the animals. The director of the institute of cattle-breeding of Königsberg reports that farmers are recommended to procure quartz lamps to prevent the occurrence of rickets in cows and valuable breeding bulls. Bees are the latest recruits to ultra-violet light treatment. We are informed that the hive hums contentedly, comes out as if the sun were shining, and manifests its well-being by building more cells and hatching the larvæ in shorter time. Among the less reputable uses to which ultra-violet light has been put is, we are told, the "making of antiques" by darkening and bleaching modern furniture and the making of "vintage" wines. This small manual will attract both medical and lay readers, for it contains interesting information and is written in a pleasant unassuming style.

L'ANÆSTHÉSIE LOCALE EN OTO-RHINO-LARYNGOLOGIE.

Par G. CANUYT, Professeur de clinique d'oto-rhino-laryngologie; et J. JOUBLOT, Chef de clinique, à la Faculté de Médecine de Strasbourg. Paris: Masson et Cie. 1930. Pp. 231. Fr.40.

Prof. Canuyt, who is well known for his work on local anæsthesia, has given us here, in collaboration with Dr. Joublot, a straightforward account of his methods in the department of oto-rhino-laryngology. Their technique is simple; the only solutions employed are 5 per cent. cocaine for surface application to mucous membranes, and 1 per cent. novocain with 0·2 per cent. of potassium sulphate as a synergist both for infiltration and nerve-blocking by injection; one drop of 1 in 1000 adrenalin is added to each c.cm. of either solution just before use. The authors deny that the use of adrenalin is followed by vaso-dilatation; on the contrary, they maintain that it favours coagulation and hæmostasis. Synthetic preparations of adrenalin are not mentioned, and the experimental proof of the advantages of ephedrine is not held to be complete enough to warrant its substitution over adrenalin. Of cocaine substitutes, butyn, or butelline as it is called in France, was found satisfactory for surface application, but is not recommended for injection; for this purpose novocain is exclusively employed. The authors state that the anæsthetic power of novocain is insufficient for the method of imbibition, or surface application; but in a later chapter, on the subject of removal of adenoids in children, they say that they are accustomed simply to paint the nasopharynx with a weak solution of novocain because "this local anæsthesia is safer than a general anæsthetic and satisfies the parents who thus know that their child will be operated on without pain." The confidence of parents in this respect does not seem justified by the facts. General anæsthesia is condemned for the removal of adenoids because of the danger of death from a general anæsthetic of any kind; similarly for tonsillectomy, general anæsthesia is said to be contra-indicated in all circumstances as being dangerous and predisposing to hæmorrhage and, especially, to broncho-pulmonary complications.

In this country, where general anæsthetics are largely given by men who have specialised in the subject, and where our students are instructed in administration by such specialists, few laryngologists will support so sweeping a statement, which takes no account of the injury inflicted on the nervous system of a sensitive child. In aural surgery the authors are less opposed to general anæsthesia, which they recommend for the mastoid operation unless contraindicated by the condition of the patient. For the radical mastoid operation, it has hitherto been difficult to secure adequate local anæsthesia of the tympanic cavity; this the authors secure by direct application of Bonain's liquid, which, however, is not likely to be successful unless there is a large perforation of the membrane. Local anæsthesia is advised for laryngectomy, but Prof. Canuyt, rather surprisingly, prefers laryngostomy to this operation for the treatment of cancer. The greater part of the book is taken up by careful and minute directions for the production of anæsthesia for every kind of intervention in the nose, throat, and ear, including the lower jaw but excluding dentistry. These directions are practical and simple, well illustrated by diagrams, and as here drawn together, constitute a useful book of reference for all workers in these regions.

TEXT-BOOK OF PATHOLOGY.

Second edition. By D. N. BANERJEE, M.D., Demonstrator of Pathology, Carmichael Medical College. Calcutta: Medical Bureau. 1929. With 305 illustrations and 9 coloured plates. Pp. 646. Rs.12.

JUDGING by the prevailing standard of European pathology, one would be bound to say that this is a bad book. It teaches practically nothing of general principles and is by no means free from inaccuracies of commission and omission. It includes bacteriology, animal parasitology, laboratory methods and laboratory diagnosis, and starts from cases in the wards rather than from bodies in the post-mortem room. It would be plainly absurd to concentrate the teaching of pathology in India round the same topics as are used in England; to give it any reality to medical students pathology must deal as far as is possible with the diseases which happen to be common. And looking at Dr. Banerjee's book from this point of view and considering the conditions under which it is intended to be used, we can imagine that it will continue to serve a very useful purpose. It is remarkably cheap.

THE PROGRESS OF LIFE.

By A. MEEK, D.Sc., Professor of Zoology in the University of Durham. London: Edward Arnold and Co. 1930. Pp. 193. 10*s.* 6*d.*

LIKE many biologists who spend a good deal of their time in actual contact with live animals in their natural haunts, Prof. Meek is altogether unsatisfied with natural selection and Mendelian heredity as adequate explanations of the world about him. He cannot get away from the conviction that the environment impresses itself on the organism which reacts to it and that such changes are or may be inherited. It is indeed a little difficult to see why anyone should want to get away from such a point of view except out of respect for convention. Prof. Meek's interpretation is Lamarckism with the addition of the "memory" conception urged by Cope, Samuel Butler, and Semon; hence he calls it "psychogenetic evolution." Equally he condemns all theories of particulate inheritance, especially the modern doctrine in which the gene is all-important. Here he is perhaps rather too sweeping. It may be that there are many mechanisms of inheritance, and that the same end is achieved by a variety of routes, the organism being relatively indifferent which it takes. Reproduction among the higher animals is usually sexual but parthenogenesis and budding and splitting of eggs also occur; the fact of reproduction is evidently controlled by the end which is attained, not by the mechanism which happens to be used. And so, too, perhaps it is by various means that the product of reproduction resembles its parents.

SLOUGH MATERNITY HOME.—Viscountess Astor, M.P., recently laid the foundation-stone of a maternity home which is being erected at Slough by public subscription. It is the first institution of the kind in Buckinghamshire.

THE LANCET.

LONDON: SATURDAY, JUNE 14, 1930.

THE SIMON COMMISSION AND MEDICAL SERVICE.[1]

THE first volume of the Report of the Indian Statutory Commission, the Simon Report, which appears this week, deals lucidly with many, if not all, the problems with which Great Britain is faced in attempting to reach the goal of British Indian policy for the future, which was laid down by the Montagu-Chelmsford Report in 1917. That policy increasingly associates Indians with every branch of the administration, and is designed to develop self-governing institutions, with a view to the progressive realisation of responsible government in India, while the country remains an integral part of the Commonwealth. It is at once apparent that the Simon Report must deal with vast interests and that controversy will be inevitable, however studiously fair the recommendations may be; and for this reason the document is being issued in two volumes at an interval of a fortnight, the Commissioners hoping that the general survey, which constitutes the first part, will be mastered before the recommendations in the second part are criticised. This way of approaching the public seems entirely reasonable, for although all political parties are recognised in the personnel of the Commission, feelings far deeper than those usually labelled political are engaged in the question of the British sphere in India.

In the survey of the administrative departments, as they function in the Indian Empire, the Indian Medical Service receives just and sympathetic notice. It is pointed out that, while the Service was primarily a military one, so that all the officers are required to serve for some years as officers in the Indian Army, still a process of transference to civil administration had been for many years in operation whereby their normal appointments could become those of the civil surgeons of a district; so that the Indian Medical Service has a double rôle to play. As is well known, since the Lee Commission the number of officers employed has been limited to those required, first, to supply a medical reserve for the Army, and secondly, to ensure the treatment of Europeans by European medical men. The new policy in relation to self-government must, moreover, limit the powers of the civil surgeon, European or otherwise, for medical administration. Here we find some, at least, of the reasons for the difficulty which the Indian Medical Service has had in the recent past in obtaining a full cadre of officers; but here, also, we may discern a prospect that this difficulty will not be permanent—even if it is not beginning to disappear. In the last available report issued by the Health Commissioner with the Government of India there is a passage, written three years ago,[2] which bears directly upon this situation, and inspires the optimistic view. "From the early days of British rule in India," says the Commissioner, "the importance of public health was realised, but the policy of Government was based on the view that it was necessary, first of all, to educate the people and to secure their goodwill towards public health measures. For this reason attention was first concentrated chiefly on medical relief." In other words, it was evident that, while the benefits of treatment are obvious, those of preventive medicine may go unappreciated, because their influence is not immediate or because, when manifest, it is misunderstood. Now preventive medicine must be based upon central administration, and this is the position which is now being reached in India. Under central administration real coöperation between the British and the Indian man of science will appear, and the immense field for scientific work which the problems of epidemic disease present in India will attract the right people for their elucidation.

[1] Report of the Indian Statutory Commission. Vol. I. Survey. H.M. Stationery Office. 3*s*.

[2] The Medical Officer, June 7th, p. 251.

NERVOUS SEMIOLOGY IN EPILEPSY.

THE progress of medicine has admittedly been achieved by a process of step by step evolution. Hence the necessity for an occasional broad survey of the existing state of knowledge. Recent observations require to be evaluated and correlated with known facts and current conceptions. And it is eminently desirable that those who have given special attention to particular problems should indicate from time to time the admitted direction of the stream of contemporary thought. Dr. KINNIER WILSON, in the Morison Lectures delivered before the Royal College of Physicians of Edinburgh early this month, chose as his theme Nervous Semiology with Special Reference to Epilepsy. His philosophic treatment of certain general considerations, to the importance of which he has become increasingly attached, was of great interest. A differentiation of nervous diseases according to a purely clinical arrangement obviously has limitations, for the same symptom or group of symptoms can arise in conjunction with lesions at different physiological levels and as a result of different pathogenic actions. Again, the clinico-anatomical method, while it has led to discoveries and advances of the first importance, has too its limitations. Hence ætiology must be regarded as the sole basis for the scientific arrangement of nervous disease. But investigation may often lag behind surmise. We shall find insuperable difficulties in establishing disease entities unless we can prove that a given causative agent produces invariably and solely the same reaction in the body exhibiting the same syndromes and amenable to the same treatment. A pathogenic agent can be regarded physiologically as a stimulus, and physiology recognises only three classes of stimuli—pure excitants, pure depressants, and those which first excite and then depress. Clinical symptoms are to be considered as representing either excitation or cessation of function, or a series in which the latter follows the former. Again, all symptoms are functional in the sense of being related to function; only when a sign is residual and static can it be regarded as organic. According to the nomenclature of HUGHLINGS JACKSON all symptoms are either positive or negative. Again a positive symptom, as exemplified by various forms of involuntary movement and pain, is an indication of the action of a functioning mechanism. Further, the localisation of a symptom, a functional system and a lesion is, in each instance, a different and separate thing. No specificity attaches in a general way to nervous symptoms, and the same may be said of

pathological changes; NISSL soon gave up the view that specific poisons produce specific cell alterations. The general conception of the essential non-specificity of neural tissue reactions, whether mesenchymatous or parenchymatous, is, in Dr. WILSON'S opinion, unassailable. A "disease process" calls forth vital efforts to cope with noxæ, and while many symptoms are proof of health, many lesions are evidence of attempts at repair. Along such lines of thought Dr. WILSON believes we shall gain a truer insight into the activities of the nervous system.

A large part of neural semiology is indicative of increase of neural function, but some varieties of epileptic seizure are considerably more inhibitory or akinetic than kinetic or excitatory. FOERSTER has suggested the possibility of sensory inhibition through hypothetical efferent fibres in relation to the symptom of pain. Impressions from the periphery in numerous instances never penetrate to the cortical level, since they are damped down or shut off at lower levels, and it may be justifiably assumed that there is some form of protection in respect of cortical action. Dr. WILSON utilises in modified form HUGHLINGS JACKSON'S conception of three levels of the nervous system. The highest level corresponds to the whole cortex outside and above the anatomical projection centres; this projection constitutes the middle level; while the lowest is taken to include what may probably be regarded as the older system—viz., basal ganglia, brain stem, cerebellum, and spinal cord. A theoretical division of fits into those of the highest, middle, and lowest level is conceivable. While every fit preceded by a definite aura must be a highest level fit in so far as that symptom is concerned, the aura is merely the prelude of the fit and not its cause. Thus fits of lowest level type, if an aura is present at all, must somehow be able at the outset to influence the cortex, assuming that to be the seat of commencement. Dr. WILSON is of opinion that there is no differentiation between the aura of hysterical fits and of organic epileptic seizures. "It is surely proper to consider hysterical seizures as highest level fits par excellence." Thus, among the symptoms referable to excitation or transcortical release on the highest physiological level are (1) an aura in consciousness; (2) types of movement coördinated and quasi-purposive, occurring either in association with convulsive movements or by themselves; and (3) post-convulsion movements and actions of the same high level class. Acute and post-epileptic phenomena form indeed an integral part of the whole. The term epileptiform convulsion should be confined rigorously to Jacksonian epilepsy—i.e., fits of the middle physiological level. When we speak of the involuntary movements of Jacksonian epilepsy we can mean little else than that they cannot be transcortically prevented. The defective inhibition may conceivably be represented by change at some wide region or in some cellular layer remote from the spot where the arcs are in action. Reflex epilepsy is an expression which has never been defined with any precision. Two cases were referred to in some detail by Dr. WILSON as demonstrating the occurrence of pure reflex response to extrinsic stimuli through areas whose nodal point is certainly situated in the cortical grey matter. The motor area of the neurophysiologist is nothing more nor less than a motor or sensorimotor ganglion pushed up into the neopallium. Prominent authorities take the view that consciousness exists on different physiological planes. Can the motor phenomena of an epileptic seizure be produced at other (lower) levels than the cortical? In the decerebrate animal absinthe will produce attacks. The distinction, sometimes still advanced by the clinico-anatomist, that the clonic element in fits is of cortical origin, the tonic of infracortical origin, cannot be upheld in its entirety, for both tonic and clonic convulsions have been produced by PIKE and ELSBERG in animals deprived bilaterally of the cortical motor areas, although it is true that DANLY claims to have proved that in the dog the cortex is required for the clonic component. A fit is difficult to define. "The clinician may claim any temporary, disorderly, paroxysmal, recurrent, uncontrolled manifestations of either motor or sensory processes as in essence a fit," and this on any physiological plane.

The term striatal epilepsy was first employed by AUGUST WIMMER, in 1925, for attacks of tonic spasm which he believed might have a striatal basis. SPILLER, in 1927, described two similar cases of brief tonic spasm under the designation "subcortical epilepsy." These spasms were brought on by voluntary movement of the limbs concerned, and the contractions were painful. Again, STERLING has suggested the term "extrapyramidal epilepsy" for cases of spastic contractions in the course of post-encephalitis, or during a more acute period, distinguished by painful spasms of fingers, toes, limbs or segments of limbs, and inclusive of facial or torticollic movement. Dr. WILSON holds, however, that the association of tonic spasm or painful spasmodic contractions with destructive lesions of the corpus striatum must be examined under very considerable reserve. Tonic spasms, being release or excitatory symptoms, cannot result from outfall of striatal cells, and the actual mechanism involved must have occupied an extra-striatal position. General tonic seizures were described by HUGHLINGS JACKSON as cerebellar fits, and Dr. WILSON has described a number of cases of the kind in his paper upon Decerebrate Rigidity in Man and the Occurrence of Tonic Fits. These attacks are found in association with a variety of conditions. The assumption of tonic attitudes and the appearance of tonic contractions are most likely to develop when the lesion dissociates physiologically the cerebral hemispheres from cerebello-mesencephalo-pontine levels, and where, therefore, striatal function also is in complete abeyance. Referring to tonic fits, Dr. WILSON remarks, with graphic humour, that "hysterical fits in the grand manner are out of fashion." One type of fit, however, occurs which has intimate affinities from the standpoint of form with what obtains in fully developed tonic fits attended by physiological decerebration. The physiology of hysteria is one of many matters in neurology which call for serious research. Certain lowest level fits are characterised by symptoms in which affective or viscero-motor phenomena predominate. It is permissible to speak in general terms of "periventricular epilepsy," by which may be designated cases remarkable for localisation of the disorder in neurosympathetic centres, at least in major degree to the exclusion (absolute or relative) of sensorimotor phenomena of somatic type. It is difficult to ascertain whether peripheral or cortical cells form the starting-point. We must postulate an open way between the focus and the percipient cortex, since in few of the seizures is consciousness ever lost. The victim is aware, only too acutely, of some violent disorder referred to his viscera, but is incapable of inhibiting it. Prominent among these lowest level fits are the "vaso-vagal attacks" of GOWERS, "pseudo-angina" and "nerve storms." The patient complains of attacks of palpitation of the heart, difficulty in breathing, a suffocating

sensation in the throat, hot flushes, coldness, sweating, shivering and trembling, nausea and other epigastric sensations, and often also an indescribably distressing feeling of impending trouble, of fear, even of imminent dissolution. Another type of case is characterised by continual yawning with constant voiding of urine, followed by violent giddiness, headache, and occasional vomiting. Dr. WILSON concluded his learned disquisition thus: "If we could but discover the secret of inhibition and of de-inhibition, if we had some scientific means of reinforcing the former at the moment when escape from control is imminent, could we but determine that switching off of the current which in some patients can be effected by potent stimuli aroused through other channels at the crucial moment, our treatment of epileptic episodes would not be so nugatory as it often proves to be."

By this running summary of Dr. WILSON'S Morison Lectures our readers should be stimulated to read the full text when it appears in the *Edinburgh Medical Journal*.

CARDIAC PAIN.

PAIN is the commonest symptom which leads patients to seek medical advice; it is the greatest safeguard we possess against the risks of undetected mischief with the inevitable consequences. When the pain is located in the chest, it is often suspected, rightly or wrongly, of being of cardiac origin. In the most serious type of cardiac pain—namely, angina pectoris—there is often little objective evidence of heart disease. The diagnosis then rests solely on the subjective symptoms, in fact on the patient's description of the paroxysms, for it is rarely that the doctor himself has the opportunity of witnessing an attack. The importance, therefore, of being able to differentiate this from other types of præcordial pain is obvious.

The outstanding feature on which the diagnosis of angina is based is its association with exertion or emotion. It is typically brought on by physical exertion or relieved by rest. The pain itself limits exertion and brings the patient to a standstill, just as dyspnœa limits exertion in the congestive type of heart failure. It has, however, long been recognised by clinicians that in some cases the pain is not relieved by rest, and may arise in the absence of any apparent exciting cause. Most of these cases are examples of coronary occlusion with myocardial infarction, and can be recognised by the associated symptoms of that syndrome. There still remains, however, a third group of cases in which præcordial pain is the patient's chief complaint, but in which that pain is not attributable to any organic heart lesion, and is not of serious significance. This type of pain used to be spoken of as false angina—a term which has rightly fallen into disrepute—for the name angina, however qualified, is associated in the lay mind with sudden death, and the patient who is branded with it lives in continual dread of a most painful and fatal malady. The benign type of præcordial pain is much commoner in women than in men, and often appears at the time of menopause. It generally differs from true angina in affecting the chest wall in the vicinity of the cardiac impulse, though not uncommonly it may radiate through to the back and involve the left arm. Its nature and diagnosis are fully discussed by Dr. DORIS BAKER in our present issue.

Dr. BAKER followed up the after-histories of a series of patients who have come to the National Heart Hospital complaining of left inframammary pain. As she points out, the pain is generally only one—though the principal one—of a large and varied group of symptoms. Its most common associates are undue fatigue, nervousness, faintness, palpitation, and certain peculiar disorders of respiration. The very multiplicity of these symptoms serves to clinch the diagnosis. They are all attributable to a common cause—namely, nervous exhaustion—and though they may prove very intractable to treatment, their prognostic significance is relatively trivial. In all types of pain, wherever situated, there are two factors to be considered—the lesion causing the pain and the sensitivity of the perceptive nervous mechanism of the patient. LIBMAN has called attention to the importance of hyper- and hyposensitivity in patients suffering from angina pectoris, the prognosis being much more favourable in the former group. This can readily be understood by the analogy of the pain of gastric ulcer. The hypersensitive subject seeks medical advice at an early stage when the ulcer is amenable to medical treatment. The hyposensitive patient, on the other hand, may suffer little inconvenience until the ulcer either erodes a large blood-vessel, causing profuse hæmatemesis, or else eats its way right through the coats of the stomach and the case comes to the surgeon as a perforation. In the type of præcordial pain to which Dr. BAKER refers it is the hypersensitive nervous mechanism which is the important factor, and treatment with sedative drugs is the line which should be adopted. As the after-history of these cases shows, though the pain may persist with remissions from time to time, the ultimate prognosis is extremely good.

THE STAPHYLOCOCCAL INFECTIONS.

THE study of staphylococcal infections from many points of view takes up more than half of the Guy's Hospital Reports for April, 1930. Invasion by staphylococci can take such varied forms, from the simple pustule to severe septicæmia, that it is difficult to regard it as a single entity; but the symposium, which opens with a survey of staphylococcal fever by Dr. J. A. RYLE, shows that its manifestations must not be dismissed as isolated phenomena, but always considered as potential general infections. Diffuse infections with *Staphylococcus aureus* have nearly all a primary skin focus, a pustule, stye, boil, carbuncle, or diffuse furunculosis; fever is present more commonly than is generally supposed, and in a considerable proportion of all cases with fever there is either a true bacteræmia or a septicæmia usually with metastases. The sites of metastatic abscesses vary with different age-periods; in children osteomyelitis of the long bones is common, while in adults the kidney is often the site of election with resulting perinephric abscess. In severe septicæmia multiple lung abscesses are frequent. Skin abscesses are not uncommon, and a solitary focus in the tibia may give rise to a Brodie's abscess. In a series of ten patients, all of whom were males between the ages of 13 and 42 years, Dr. RYLE found that three had histories suggesting previous ill-health, three were overworked medical men, and one was a neglected boy in poor circumstances. In seven out of the ten there was an account of a primary focus, either a boil or other cutaneous sepsis. All had fever, and all, with one exception, developed localised abscesses; only one death occurred in the series, in a man who developed a cerebral abscess. Dr. RYLE found that these results supported his previous experience of staphylococcal fever during the war and in hospital. In estimating the prognosis he says: "Given a

sound physique, a reasonably early diagnosis, a good leucocytosis and watchful care, the great majority of cases should recover, although the course of the disease is often very prolonged."

The differential diagnosis is notoriously complex. Dr. RYLE makes the distinction from typhoid fever on the presence of an active or recent primary focus, the absence of marked splenic enlargement, rose spots or intestinal symptoms, and the presence from the beginning of a leucocytosis. He adds that the pulse in staphylococcal fever is frequently slow in proportion to the temperature. Hæmoptysis, night-sweating, and pleuritic effusion may well suggest a diagnosis of acute pulmonary tuberculosis; but again the leucocyte count, the history and sputum examinations should help to decide the issue. Dr. RYLE emphasises the frequency and diagnostic significance of sweats in staphylococcal fever, whether due to a focal or general infection; after tuberculosis and infective endocarditis it should be regarded as one of the most important of the "sweating" fevers. In discussing treatment he refers to the methods of Sir WILLIAM GULL. At a time when various remedies for rheumatic fever were being vaunted, GULL decided that without a knowledge of the natural course of the untreated disease it was impossible to judge the efficacy of therapeutic measures. He therefore reported, with close care and the collaboration of Dr. H. G. SUTTON, a series of cases treated, apart from nursing and symptomatic measures, by mint water alone. Using this series of controls, he found no evidence that the course of the disease was influenced by the remedies supposed to be specific; the work was a model of reasoned clinical research. Dr. RYLE holds that the present vogue for the use of vaccines and chemotherapy in septic states has as slender a basis as had the old rheumatic remedies which were discredited by GULL'S efforts. In his view, "when the body is competing with a vast invasion of living organisms it can scarcely be regarded as a sound principle to inoculate it with a few more millions of dead organisms; in practice I have never yet been assured of resultant benefits. Nor have I seen good done by injections of eusol or mercurochrome in cases of septicæmia, or been persuaded by the literature of the subject that the happy results which sometimes follow the treatment are due to it." The principles of treatment which he recommends are three: first, good nursing; secondly, a copious fluid intake of at least six pints of fluid in the 24 hours for an adult; and, thirdly, watchful clinical care for metastatic abscesses, and considered judgment which to open and when to open them. Osteomyelitis calls for early operation. An established perinephric abscess should be dealt with without delay, and the loin may be incised with advantage in perinephritis even though no pus be found. Abscesses in skin and muscle should, of course, be opened when "ripe." Pulmonary abscesses are better left to themselves. Pleuritic fluid may be aspirated. Should a stage of weakness and low fever without organisms in the blood stream follow upon an acute septicæmic phase, sunshine and fresh air are invaluable adjuncts to treatment. Even a slight persistent pyrexia should, however, suggest the possibility of a hidden abscess, and the body should be searched systematically with a finger-tip in likely regions for any tender point or points. If there is any suspicion of a focus in bone, a careful radiographical examination is also necessary.

Mr. J. L. JOYCE'S communication to the symposium will give guidance on therapeutic procedure in renal cases. He advocates conservative treatment at operation where possible, since removal of an affected kidney may be deeply regretted should its fellow become involved subsequently. But some cases which subside spontaneously without healing progress finally to complete destruction of the renal tissues; in these nephrectomy is the rational treatment. Resection of the affected portion of the kidney in acute cases does not seem to Mr. JOYCE a useful procedure, and he advises rather the relief of tension and drainage in the early stages, with subsequent nephrectomy if this conservative policy proves insufficient. Staphylococcal lesions of the skin are dealt with by Dr. H. W. BARBER. He indicates the principles of treatment in which fresh air and exercise coupled with plenty of vegetables and fresh fruit in the diet play an important part. He also finds little value in chemotherapy and considers that vaccines require great skill and experience for their proper use. As far as local treatment goes, he advises applications of iodine for boils, and emphatically disapproves of the use of poultices or boric fomentations. Typical and atypical cases where staphylococcal lesions are present are described by Dr. HUGH BARBER, Dr. W. J. COTTON, Dr. J. F. VENABLES, and Dr. LESLIE J. WITTS, while Dr. F. A. KNOTT outlines a method of differentiation between active and inactive leucocytosis which he devised primarily for another purpose. It is based on the principle that if washed bacteria are added to fresh blood, the active leucocytes will act as phagocytes, while inactive devitalised white cells will not function. This procedure has not been tried out by Dr. KNOTT in inflammatory conditions, but he suggests its possible application to prognosis. If from any hæmatological evidence a healthy leucocytosis could be distinguished from one produced by a flagging hæmopoietic system the prognosis not only of staphylococcal but of streptococcal infections might be less difficult.

Annotations.

"Ne quid nimis."

PENAL SERVITUDE FOR THE INSANE.

MEDICINE and law notoriously disagree in their views of the relation between crime and insanity. The strange tangles which result from the legal position were illustrated afresh lately in the Court of Criminal Appeal. A man named Daniel Kenneally had been sentenced at the Central Criminal Court to ten years penal servitude for wounding Arthur Broomfield with intent to murder him. Kenneally and his victim, it appeared, were fellow-workmen at a brewery. Kenneally, at the time of the wounding, said "I have had news this morning of my father's death; that man killed my father, and I have killed him. Am I right in doing so?" This was obviously a delusion; his father was not dead, and Broomfield had had no quarrel with the father. The judge at the trial thought the accused was insane; Kenneally had had a good character for ten years, but there was evidence of his having suffered from insane delusions for some time. After conviction, Kenneally was actually certified insane, and was transferred or recommended for transfer to an asylum. Three questions will occur to any medical practitioner who reads these facts. First, how came Kenneally to be convicted at all? The answer to this question appears to be that the defending counsel, seemingly thinking that the circumstances were not strong enough to justify a plea of insanity within the rule in McNaghten's case, withdrew the plea of "Not Guilty." Counsel are generally disinclined to plead insanity in

borderline cases, because insanity means an indefinite incarceration in a criminal lunatic asylum as against a definite and possibly shorter period in prison. Here, however, counsel did not plead "Not Guilty," doubtless hoping to offer reasons for mitigating the sentence. This brings us to our second question: why was Kenneally, whom (according to the Court of Criminal Appeal) the judge at trial thought insane, sentenced to ten years penal servitude? The answer must be that the judge thought this best in the man's own interest, knowing that Kenneally would receive curative treatment during his sentence. The tribunal, indeed, could hardly allow Kenneally to remain at large; there was thus no alternative to a sentence of imprisonment. Lastly, what did the Court of Criminal Appeal do about it? The answer to this third question is that the learned judges reduced the sentence to three years penal servitude, evidently shrinking from the prospect that, if Kenneally should be discharged from the asylum as cured, he would be liable to serve the balance of a long period of imprisonment. The Court of Criminal Appeal, it seems, gives the man three years in which to obtain his cure. It is all very perplexing, but what can we expect of the law which, while declaring that guilt involves a consciously criminal intention, still retains the ridiculous phrase "guilty but insane." That phrase did not form the verdict in this particular case, but Kenneally's trial is a remarkable infringement of the rules of common sense. The man should not have been found "guilty"; he should not have been sentenced to ten years penal servitude, nor yet to three. Who can doubt that the insanity from which he is now certified to be suffering was already upon him when he wounded Broomfield? How long will it be before we have some simple machinery whereby a man like Kenneally can be placed directly in some curative institution without the farce of trial, sentence, penal servitude, and appeal?

EXPLOSION OF ANÆSTHETICS.

THE American Medical Association's committee on anæsthesia accidents has come to the conclusion[1] that the hazard of explosion is negligible compared with other risks, such as post-operative pulmonary complications. Since, in their opinion, the machines and methods which are inherently liable to the accident of explosion are the very ones which greatly reduce liability to these complications, they hold that the risk of explosion should not deter anæsthetists from employing such machines and methods. But the underlying assumption is surely open to criticism, for the current view of post-anæsthetic infections of the lung is that they are determined more by the site of operation than by any other consideration. Whatever the anæsthetics employed, lung troubles follow operations on the upper abdomen more often than elsewhere. As might be expected, the report deals largely with ethylene. Explosions from ether are entirely avoidable, since for their occasion a naked flame or cautery must be used in the vicinity of the ether. But in the case of ethylene the unavoidable danger arises through electric discharge originating within the apparatus that has to be employed for administration of the gas. With present existing apparatus there appears to be no certain means of avoiding explosion, although the accident is fortunately rare. It is so rare, in fact, that the committee considers the risk should be run, in preference to employing other methods which more often cause pulmonary sequelæ, although free from explosive risk. "For full anæsthesia the concentration of ethylene is above the explosive limit. The chief risk of explosion comes when the ethylene is shut off, and the patient's lungs and the apparatus itself are washed out with oxygen or oxygen and carbon dioxide. During this process the mixture of gases passes through the entire explosive range. The mixtures of ethylene and oxygen used for analgesia during labour are highly explosive." The most explosive combination is the 25 per cent. ethylene and 75 per cent. oxygen mixture. The committee records a dramatic and fatal explosion with this mixture. Their recommendation is that non-conducting rubber should be eliminated, and so far as possible the entire apparatus should be constructed of metal. In particular they suggest that a small spirometer or a simple rebreathing chamber should be used in place of the rubber rebreathing bag.

[1] Jour. Amer. Med. Assoc., May 10th, p. 1491.

WORK OF THE ROTUNDA HOSPITAL.

THE report of the Rotunda Hospital for the year 1928–29 has been presented by Dr. Bethel Solomons, Dr. W. A. Taylor, and Dr. O'Donel Browne. During the year under review 2034 women were delivered in the hospital, and 1805 in their own homes. There were 12 deaths—10 in the hospital and 2 in the extern department, which are accounted for in the following ways: tuberculosis, 2; broncho-pneumonia (shortly after delivery), 1; sepsis, 4; accidental hæmorrhage, 2; hyperemesis gravidarum, 1; chorea, 1; and eclampsism, 1. The outstanding feature of the report is the phenomenally low morbidity-rate which obtained in the hospital during the year. Of the 2034 women delivered only 57 were morbid, as judged by the British Medical Association standard, and when it is realised that this figure includes the deaths, and that but few of the women attended any antenatal clinic, it is doubtful whether any other maternity hospital has ever produced such astonishingly good results. There were 13 cases of placenta prævia without a death, and Dr. Solomons claims that he has not lost a case from this complication during his Mastership. There were 9 cases of eclampsia with one death, 43 cases of accidental hæmorrhage, 27 cases of prolapse of the cord, 521 cases of albuminuria, and 1 case of rupture of the uterus, successfully treated by hysterectomy. In the list of presentations 67 are described as "face," and 16 as "face to pubes." Both figures are obviously wrong. In the list of operations we find that 963 operations were performed on the 2034 patients, so that nearly every second woman had to submit to some operation. Cæsarean section was performed on 34 occasions, and twice for uterine inertia. Cæsarean hysterectomy was performed twice, once for uterine inertia. The perineum was lacerated in 602 cases—a very high figure. The fact that the morbidity-rate was kept so low in spite of the large number of operations performed is a tribute to the skill of Dr. Solomons and his staff, but will in no way satisfy those who believe that conservative methods offer the only hope of lowering the present high mortality-rate associated with childbirth and had always regarded the Rotunda Hospital as a bulwark against easy but dangerous midwifery. The gynæcological department was very active, and operations were performed on 664 women. There were seven deaths, of which four might justifiably be excluded. The hospital has its own radiological department, and Dr. C. L. McDonogh, the radiologist, treats cases both with X rays and radium. The report contains a short account of the pædiatric department by Dr. B. Crichton, and concludes with a short pathological report drawn up by Dr. F. S. Bourke.

ADHESIVE SPECTACLES.

SOME of the medical and scientific papers in Germany have recently been discussing the possibility of doing away with spectacles, at least for the higher grades of refractive error, by the use of glass scales applied directly to the cornea. The principle has already been tried in the extreme case of conical cornea, and Prof. Leopold Heine has been extending it at the eye clinic of the University of Kiel.[1] Adhesive glasses (Haftgläser) as he calls them are thin glass

[1] Munch. Med. Woch., 1930, lxxvii., 6.

scales adapted to the curvature of the cornea and worn beneath the eyelids. The curvature, which varies accordingly to the refractive error to be corrected, is calculated mathematically by a special instrument. It is claimed, for instance, that a myope of 20 dioptres, condemned to wear clumsy heavy concave glasses, can by placing a pair of suitable scales under his eyelids be converted practically into a person with normal sight, with very little alteration in the appearance of his eyes. Indeed, in the *Umschau* for March 22nd photographs are given of a high myope in whom the contrast in appearance of the two types of correction is very striking. In the photograph without spectacles there is a correcting scale beneath the left eyelid, and the difference between this and the right eye is not discernible. Astigmatism, if present, automatically disappears. In hypermetropia the scales should be especially valuable where the crystalline lens has been removed for cataract and a thick convex glass has to be worn. Prof. Heine, who has made the subject his hobby for years, states that, while adhesive glasses occasion the wearer some inconvenience at first custom is soon established just as is the case with artificial dentures. The scales become a part of the eye, accommodating themselves to all its movements, and are lubricated by the lacrymal secretion. At first they can only be worn for an hour or two, but after a time more or less all day. The range of vision afforded to the wearer is much greater than with ordinary spectacles. The scales are made by Zeiss, of Jena, of special glass which is not attacked by the fluid of the eye. Prof. Heine believes they are less dangerous to the wearer than spectacles when playing tennis or cricket, since the eye is naturally protected by the socket, and the scale shares this protection. Their potential value for the short-sighted swimmer is obvious. Whether they are likely to come into common use time only will tell. At present there is little practical experience to go on; the cost is high, the initial discomfort is great, and the outlook is doubtful. But undoubtedly the same could have been said of the first dental plates, and now everyone wears them.

AMYTAL.

AMYTAL is the trade-name of iso-amyl-ethyl barbituric acid, and it has now been employed as an anæsthetic in a fair number of cases. As it is given intravenously it has the same disadvantage as the other drugs given by injection—namely, that it is only possible roughly to estimate the required dose, and this cannot be regulated by symptoms, and varied accordingly in the way that makes inhalation anæsthesia so comparatively safe. It appears that amytal, if used without risk, is rather a hypnotic than a true anæsthetic. For dogs in the laboratory it has been of great service as an anæsthetic, but for the human subject it is best used in the same way as avertin is—that is to say, as an excellent means of pleasantly inducing unconsciousness while the patient is in bed, so avoiding mental disturbance and rendering the patient easily susceptible to true anæsthesia induced by some other means. J. T. Mason and J. W. Baker [1] regard very favourably the combination of amytal and spinal anæsthesia. They say that "unless thoroughly familiar with both amytal and spinal anæsthetics the anæsthetist may find it easier first to establish the level of anæsthesia with the spinal anæsthetic, and thereafter administer the amytal. However, with studied judgment the most satisfactory of all results may be obtained by administering in the room beforehand sufficient sodium amytal to put the patient barely in a twilight stupor, such that he is free of anxiety yet can still be aroused to coöperate for the lumbar puncture." It seems that this cannot be an easy state to hit off exactly, for they remark that when the amytal is first given the patient often proves hypersensitive, and makes lumbar puncture difficult. The amount required to produce sleep is generally from grs. 3 to 9 and excitement before sleep comes is very rare. The sleep after operation is from 24 to 48 hours, and during this time the patient needs careful watching to avoid mechanical respiratory obstruction. There appears to be considerable risk of insufficient pulmonary ventilation during this period, and also a large percentage of patients require catheterisation.

[1] Surg., Gyn., and Obst., May, 1930, p. 828.

ENLARGEMENT OF THE ROYAL FREE HOSPITAL.

THE Royal Free Hospital celebrated its centenary in 1928, and to mark the occasion an appeal was launched to provide funds for development. The desired improvements, placed in the order in which they could best be carried out, were as follows: (1) provision of new quarters for the female venereal diseases department; (2) a "central extension" comprising a boiler-house and engineering department, central kitchens, enlargement of the pathological department, and new quarters for the obstetric and gynæcological unit; (3) completion of the Alfred Langton Home for Nurses; and (4) provision of private rooms for paying patients. At about the time when these ambitious proposals were made public it was announced that Mr. George Eastman, of Rochester, New York, had offered to give £200,000 for a dental clinic at the hospital on condition that an endowment fund of £100,000 was raised. Lord Riddell and Sir Albert Levy at once agreed to provide this endowment, and the result is that the clinic is nearly finished and will be opened in the autumn. The rebuilding of the venereal disease quarters is also nearly complete; the contractors have begun to put up the central extension, and it is hoped that work on the nurses' home will begin shortly. The financial position in regard to these developments may be summarised as follows:—

	Cost.	Raised to date.
	£	£
V.D. new quarters	10,000	10,000
Central extension	225,000	95,000
Nurses' home extension	65,000	20,000
Dental clinic building and equipment	200,000	200,000
Endowment	100,000	100,000
	600,000	425,000

Of the £95,000 raised for the central extension, £50,000 is a further gift by Sir Albert Levy. The provision of pay-beds will have to be left over till the present commitments have been met. Meanwhile the hospital is to be congratulated both on its aims and on the extent of their realisation. The public should not be slow to find money for a charity which has found so much for itself. That the Royal Free Hospital deserves their support is obvious to anyone who considers its record or its opportunity.

STUDIES IN SCARLET FEVER.

THE May issue of the *Jahrbuch für Kinderheilkunde* is devoted to infectious diseases, with papers by the various workers in the children's fever section of the Wilhelmina Hospital in Vienna. Most of them describe clinical studies of scarlet fever, and their approach to the subject makes the reader regret that pædiatricians in this country get little or no opportunity for the scientific observation of children with infectious fevers. E. Gabriel and H. Zinchinsky write on second attacks of scarlet fever, and analyse their own cases. The gross material is represented by 20,000 cases of scarlet fever admitted between 1902 and 1929. This total has to be reduced slightly because of incomplete observations, but among the large number of cases remaining there are 387 examples of second attacks—a percentage of 1·9. From the distribution of these cases in the various years and from general epidemiological considerations it appears

that fresh infection must be assumed to cover the facts. The cases were further divided into four groups: (1) those in which both attacks were unmistakable; (2) those in which there was doubt about the first attack but the second was unmistakable; (3) those in which the first attack was certain, but the second left room for doubt; and (4) a group in which during the same period of hospitalisation three unmistakable attacks of scarlet fever occurred. The first and last groups present many points of interest; in the first there are 179 cases where both attacks were observed by the authors of the paper. A typical case illustrating the material used is that of a two-year-old girl who was admitted with unmistakable scarlet fever on July 13th, 1908. Whooping-cough developed on the 26th after the onset of nephritis. By August 6th the child was afebrile, the lungs clear, and the urine free from albumin. On Sept. 11th, however, a second unmistakable attack of scarlet fever occurred with fever, rash, and sore-throat, with peeling beginning on the 25th. Particulars are given of many other cases illustrating the various groups and subsections described and the whole study of over 80 pages is full of interesting facts and deductions.

A second paper by Zinchinsky deals with endocarditis as a complication of scarlet fever. Out of the 20,000 total cases already mentioned he is only able to find ten with evidence enough to justify the diagnosis of endocarditis. Seven of them came to autopsy, and in these the scarlet fever was of the "septic" type, with endocarditis of the infective or malignant variety. The three remaining patients survived, and two of them had typical polyarticular acute rheumatic symptoms late in the scarlet fever, so that the ætiology of the resulting mitral disease was in doubt. Only one case out of all the 20,000 appeared to be a genuine example of mitral insufficiency following scarlet fever, and it is therefore concluded that this form of streptococcal infection plays no practical part in the production of permanent damage to the mitral valve. Zinchinsky also contributes a paper on two cases of primary suppurative meningitis with scarlet fever. In one of them a child of 8 years with severe scarlet fever developed otitis media in the second week, and signs of meningitis at the end of the third week. A hæmolytic streptococcus was cultured from the cerebro-spinal fluid and the child died. No direct connexion between the aural disease and the meningitis was established at autopsy. The second example began with mild scarlet fever, but developed otitis media by the thirteenth day of the illness and meningitis by the twenty-seventh day. The cerebro-spinal fluid confirmed the diagnosis of suppurative meningitis, being turbid with excess of cells, mostly polymorphonuclear leucocytes. Bacteriological cultures were sterile in this patient, and greatly to the surprise of the observers he began to make a recovery after only three days of meningeal symptoms, eventually becoming quite well.

MEDICAL BENEFIT IN NORTHERN IRELAND.

THE Medical Benefit Bill,[1] writes our Belfast correspondent, did not pass its second reading in the Senate without weighty opposition, which was voiced by senators who are strong supporters of the present Government and who represent large country districts. The opposition was based on the grounds that there was no demand for such a measure in rural areas, and that it was the most unpopular piece of legislation yet introduced. Neither the farmers, whose agricultural prospects were gloomy, nor the farm-workers, whose wages sometimes only amounted to 24*s*. per week, wanted to pay the extra penny per week for the doubtful advantages conferred by medical benefits. Great regret was again expressed that the report of the Local Government Committee had not been adopted. Protests against the rushing of the Medical Benefit Bill were made at a meeting of the Ulster Senate on June 5th, when a Government motion was put forward to suspend standing orders so that the third reading of the measure might be taken. Ultimately, however, the Bill was read a third time and passed.

[1] See THE LANCET, May 31st, p. 1204.

NATURAL HISTORY OF DENGUE.

DENGUE appeared in Athens in the autumn of 1927, and in the following year it reappeared and spread so quickly that there was a pandemic in the city and numerous other foci throughout the country, especially in the ports.[1] Among those who studied the outbreak were G. Blanc and J. Caminopetros,[2] and they have been able to record a number of important facts about the disease. They show, for instance, that dengue serum, when kept in properly sealed tubes and at laboratory temperature (15–18° C.), can preserve its virulence for at least 54 days. Man may be attacked by symptomless dengue though his blood at the same time is virulent for others. Likewise the guinea-pig shows no evidence of febrile illness after inoculation with active dengue serum, but its blood becomes virulent five days afterwards. As regards the insect vector, these workers have ascertained that *Stegomyia fasciata* has been abundant in old Greece for a long time, and it is extremely common in Athens, where it is a domestic species and breeds in the customary situations. Experimental reproduction of dengue by means of infected stegomyia was successful—in the first instance with mosquitoes actually fed upon patients, and secondly, with those caught in dengue-infected houses. By triturating the bodies of infected mosquitoes in normal saline solution and conveying the material to the island of Spinalonga, which is 350 kilometres from Athens and remained free from dengue, they were able to reproduce the disease in two volunteers from that island. Their experiences upon the rearing and breeding of stegomyia in captivity correspond on the whole with what is already known. Some individual insects captured in Athens in October survived the winter and lived over 200 days. During the whole period they were fed upon human blood and remained active even at a temperature of one degree below zero, and the cages were taken daily in a motor-car to the hospital for feeding experiments. The net result of this work was to confirm that of Siler, Hall, and Hitchens on the ability of stegomyia to transmit the virus of dengue, and the inability of *Culex fatigans* to do so. An incubation of eight days in the body of the mosquito is necessary for the virus to develop, but at a temperature of 22° C., although the virus is conserved in the body of the insect, it is not transmitted by its bite. From the experiments of Siler and his co-workers [3] it is known that the virus can be conserved in the body of the insect for very considerable periods—in these experiments for 92 days. When the temperature is depressed below 20° C. they lose their transmissibility, but regain it directly it rises to 20–22° C. The results noted by Blanc and Caminopetros differ from those of the American workers in that they find that the virus of dengue persists in the blood of patients beyond the first three days of the illness, and remains infective for 15 days and can be passed with ease through Chamberland filter L at atmospheric pressure. Many attempts were made to transmit dengue to the lower animals. The dog and the rabbit seem to be resistant to infection, while the white rat succumbs quite exceptionally. Monkeys, on the other hand, appear to be slightly susceptible and have what Nicolle and Lebailly term an inapparent infection; although they do not show any ill-effects their blood remains virulent for man for 18 days. These facts

[1] See THE LANCET, 1928, ii., 454.

[2] Ann. de l'Inst. Pasteur, April, 1930, p. 367.

[3] Siler, J. F., Hall, M. W., and Hitchens, A. P., Jour. Amer. Med. Assoc., 1924, lxxxiv., 1163.

were ascertained by experiments on nine monkeys of four different genera.

All the facts and epidemiological investigations so far accumulated go to show that a definite and persistent immunity is evoked by dengue, but convalescent serum taken after the crisis and for six months afterwards has no protective qualities. It has been found that neither the virus of yellow fever nor convalescent serum in that disease have any modifying action on the virus of dengue. This virus, it is found, cannot withstand desiccation and is probably contained in the serum globulin. It is destroyed by the action of bile in dilutions of 1·5 to 1·15 within five minutes. Pituitary and thyroid extracts have no action, and it is resistant to alcohol, formol, and Lugol's solution. In continuation of the inoculation experiments, Blanc and Caminopetros claim to have demonstrated that by repeated inoculation at short intervals with bile-treated virus, it is possible to protect to a certain extent against the fresh active virus.

ALEXANDER WOLLASTON.

THE medical profession mourns a distinguished colleague in Alexander Wollaston, the gallant and learned explorer, who was murdered in Cambridge last week. From Clifton, where he received his early education, he went to King's College, Cambridge, where he became a Fellow. He entered the London Hospital as a medical student, and shortly after qualification commenced the series of exploratory missions of which his adventurous life was largely made up. In 1905–07 he was a member of a British expedition to Ruwenzori, Central Africa; he joined an expedition which was engaged in 1909–11 in Dutch New Guinea; and of the second expedition to the same district which was in operation for the two years before the war he was leader. During the war he served as a surgeon in the Navy, was mentioned in despatches and received the D.S.C. Lastly he was medical officer and naturalist to the Everest Expedition in 1921. With this wonderful record of adventure behind him he seemed at one time content to live an English country life, and he settled in Gloucestershire with a young wife and children. But his own College sought his help as tutor, and his brief tenure of the post showed how right had been the choice. The scene at his funeral testified to the widespread grief at his tragic end.

Dr. Christopher Addison has been appointed to succeed Mr. Noel-Buxton as Minister of Agriculture and Fisheries.

AFTER a lengthy hearing, the suit brought by the Scarlet Fever Committee in the United States of America against the Lederle Laboratory, for infringement of the patent dealing with scarlet fever antitoxin and the toxin used in the Dick test, has been decided in favour of the Scarlet Fever Committee. The American patent was held to be valid.

WE regret that the name of Colonel William Coates, of Manchester, was omitted from the list of Birthday Honours given in our last issue. He has been promoted to the rank of Knight Commander in the civil division of the Order of the Bath.

BIRMINGHAM HOSPITALS CENTRE.—It was recently announced that Mr. Harry Vincent, a Birmingham business man, had promised £100,000 to the Birmingham Hospitals Centre scheme on condition that £350,000, including the sum already collected, was subscribed by June 6th. When the period of grace expired the fund stood at £378,000, and the redemption of the promise brings up the total to £478,000. Messrs. Cadbury Bros., Ltd., have given £100,000, which includes the value of the site, and the individual contributions of members of the Cadbury family amount, in addition, to £40,000.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. R. Russell is transferred to the Permanent List.

The following appointments are notified: Surg. Lt.-Comdr. J. F. H. Gaussen to *Victory*, for R.N. Hospital, Haslar; Surg.-Lts. J. M. McNamara to *Ladybird*, and D. R. F. Bertram to *Codrington*.

ROYAL NAVAL VOLUNTEER RESERVE.

The following appointments are notified: Surg. Lt.-Comdrs. F. L. Cassidi to *Constance* and H. O. Martin to *Rodney*. Surg. Lts. R. L. Stubbs to *Victory*, for R.N. Hospital, Haslar, and F. W. Chippindale to *Champion*. Proby. Surg. Lt. W. B. Wilson to *Marlborough*. Surg. Sub.-Lt. A. F. Davy to *Champion*. Proby. Surg. Sub.-Lts. W. H. C. Watson to *Renown*; J. C. Livingston to *Rodney*; R. W. Riddle to *Concord*; H. A. Lockhart to *Courageous*; and J. F. M. Milner to *Warspite*.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. & Bt. Col. (temp. Col.) A. C. H. Gray, R.A.M.C., to be Dir. of Pathology, War Office.

The undermentioned Lt.-Cols., from R.A.M.C., to be Cols.: Bt. Col. R. B. Ainsworth and Temp. Col. D. S. Skelton.

The undermentioned Lt.-Cols. retire on retd. pay: A. W. Gibson, E. V. Aylen, and W. Davis.

Majs. to be Lt.-Cols.: Temp. Lt.-Col. A. Dawson, vice Lt.-Col. & Bt. Col. R. B. Ainsworth; Temp. Lt.-Col. C. R. M. Morris, vice Lt.-Col. A. W. Gibson; Bt. Lt.-Col. (temp. Lt.-Col) R. E. U. Newman, vice Lt.-Col. E. V. Aylen, to retd. pay; E. W. M. Paine, vice Lt.-Col. W. Davis, to retd. pay; and Temp. Lt.-Col. J. B. Grogan, vice Lt.-Col. (temp. Col.) D. S. Skelton.

Majs. to be temp. Lt.-Cols.: J. B. Grogan, E. M. O'Neill, G. B. Edwards, and J. W. L. Scott.

Capt. H. A. Hill to be Maj.

Col. E. P. Sewell, late R.A.M.C., retires on retd. pay.

Lt.-Col. J. Mackenzie, from R.A.M.C., to be Col.

Maj. & temp. Lt.-Col. E. M. O'Neill to be Lt.-Col., vice Lt.-Col. J. Mackenzie.

Maj. & Bt. Lt.-Col. W. C. Smales to be temp. Lt.-Col.

ARMY DENTAL CORPS.

Capts. J. Morrey and J. Baillie to be Majs.

TERRITORIAL ARMY.

Capt. J. W. Wayte to be Maj.

Lt. R. Lodge (late R.G.A., Spec. Res.) to be Lt.

ROYAL AIR FORCE.

Flight Lt. E. P. Carroll is transferred to the Reserve Class D (11).

INDIAN MEDICAL SERVICE.

Lt.-Cols. J. C. Clements and C. L. Dunn retire.

COLONIAL MEDICAL SERVICES.

Dr. J. A. Henderson, Senior Medical Officer, Palestine, to be Senior Sanitary Medical Officer, Jamaica.

The following appointments have been made: Dr. S. M. Bernard, Lady Medical Officer, Federated Malay States; Dr. G. F. West, Medical Officer, Malayan Medical Service; Dr. P. J. Gonsalves, Assistant Medical Officer, Seychelles; and Dr. E. B. Murray, Medical Officer (Anæsthetist), Straits Settlements.

DEATHS IN THE SERVICES.

Lt.-Col. Frederick William Gee, C.I.E., who died after an operation on June 2nd at the Royal Northern Hospital at the age of 67, was the eldest son of the Rev. William Gee, of East Coker, Somerset. He received his early education at Sherborne; afterwards he entered University College Hospital, obtained the M.R.C.S. Eng. and L.S.A. in 1886, and graduated M.B., B.S. at the University of London in the following year. A year later he entered the Indian Medical Service and was at the relief of Chitral in 1895 (medal and clasp). In 1897 he served on the North-West Frontier (Tochi clasp), and three years later, when he was promoted to the rank of Major, he was with the anti-Boxer campaign in China (medal). He also saw service in East Africa, where he was at one time base medical officer, and in the operations in Somaliland (mentioned in despatches, medal and clasp). He became Lt.-Col. in 1908. For work in Mesopotamia during the late war (mentioned in despatches) he received the C.I.E., and he retired in 1920.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles Contributed by Invitation.

LXXVI.—CHEMICAL TESTS OF PANCREATIC EFFICIENCY.

PART II.*—SIGNIFICANCE OF THE TESTS IN VARIOUS CLINICAL CONDITIONS.

IN acute lesions of the pancreas the function tests are often valuable, but in chronic lesions they are often disappointing.

Acute Diseases of the Pancreas.

A patient suspected of having acute hæmorrhagic pancreatitis is generally regarded as a surgical case and in urgent need of exploratory laparotomy. None the less, in the limited time available, whilst the patient and the theatre are being prepared, Loewi's reaction, an examination of the urine (for sugar in particular), and an estimation of urinary diastase can readily be performed. The results would almost certainly be of real value to the surgeon, either in confirming his diagnosis and thus supporting a direct attack on the pancreas, or in lending no support to his diagnosis and thus possibly justifying post-

Condition.	Loewi's test.	Glycosuria.	Hyperglycæmia.	Urinary diastase* units per 1 c.c.m.	Trypsin in duodenal fluid.	Creatorrhœa.	Lipase in duodenal fluid.	Steatorrhœa.	Fat in fæces.	
									Total fat† (per cent. of dried fæces).	Split fat (per cent. of fæcal fat).
Health.	0	0	0	6·7 to 33·3.	+	0	+	0	Up to 25.	75 or over.
Acute pancreatitis.	Often +.	Often +.	Often +.	100 to 2000.	—	0 or +.	—	—	—	—
Trauma of pancreas.	0 or +.	0 or +.	0 or +.	6·7 to 200.	—	,,	—	Usually 0.	Normal or raised.	Normal or less than 75.
Chronic pancreatitis.	Usually 0.	Usually 0.	,,	Usually normal.	+ or ±.	,,	+ or ±.	0 to + +.	,,	,,
New growth of pancreas.	,,	,,	Usually 0.	6·7 to 100.	+ or 0.	,,	+ or 0.	,,	,,	,,
Chronic obstruction of pancreatic duct.	,,	,,	,,	6·7 to 100.	0	+	0	,,	Usually over 25, up to 50 or more.	Usually below 75, down to 30 or less.
Diabetes mellitus (excluding "true pancreatic").	0	+	+	Normal or low.	+	0	+	0	Normal.	Normal.
New growth of islets.	0	0	Hypoglycæmia.	Normal.	+	0	+	0	,,	,,

0, signifies negative; +, positive; + +, true steatorrhœa; —, not known with certainty; ±, present but diminished.
* The 24 hours' urine except in acute pancreatitis. † Figures refer to adults.

ponement of the operation to allow of further investigation, or suggesting that an alternative surgical approach would be more useful. It is still necessary to approach the subject with great caution since none of the series of suspected cases of acute pancreatitis (published together with control cases), has been large enough to permit dogmatic statements. The results in normal and diseased persons of the three tests which can be performed at short notice are included in the Table.

Chronic Diseases of the Pancreas.

In chronic diseases of the pancreas if two or three tests give positive results the existence of pancreatic disease is likely; but if all give negative results, pancreatic disease is not excluded. An examination of the urine, including an estimation of diastase, should be made as a routine. The naked-eye appearance and microscopical examination of the fæces likewise should always be undertaken, but other tests should be reserved as an extension of particular clinical observations and for the special investigations indicated in Part I. of this article. The usual findings in chronic pancreatitis, and in neoplasm of the pancreas, and when the pancreatic duct is obstructed—e.g., by a calculus—will be found tabulated below.

Diabetes Mellitus.

In most diabetics the islets of Langerhans alone are seriously affected. In some, judging from post-mortem histological examination, there is no evidence of damage to the islets, in which case either a functional inefficiency of the islets or a disturbance of the balance between the different ductless glands, or a disorder of other mechanisms controlling the output or availability of the internal secretion of the pancreas must be assumed. In most cases of diabetes efficiency tests reveal no abnormality of the external secretion of the pancreas, and it is assumed that the lesion or functional inefficiency is mostly limited to the islets. In a few cases there is extensive disease of the whole gland (in dogs about nine-tenths must be removed to cause diabetes), so that there is both diabetes and an inefficient external secretion. This comparatively small group has been classified separately by some writers as "true pancreatic diabetes." With the exception of this group, therefore, the external secretion tests given above are of no value in diabetes mellitus, but are useful only in the examination of diseases of the whole gland or its ducts.

Hyperinsulinism, or Idiopathic Hypoglycæmia.

Of recent years a few cases of hyperactivity of the pancreatic islets have been reported. At operation or post mortem either an adenoma or a carcinoma of the islet tissue has been found. The neoplasm may be localised, in which case it can be removed surgically, but it is more often diffused throughout the gland. The symptoms are those of a persistent overdose of insulin, and the blood-sugar is low except when suitably relieved by carbohydrates.

Summary of Results of Tests.

The Table, which gives the results of those tests of pancreatic efficiency which are generally considered the most helpful, illustrates the fact that all the pancreatic function tests so far devised are frequently equivocal.

Other Tests in Pancreatic Disease.

Certain other tests have been tried with even less conclusive results Of these Sahli's glutoid capsule test, Schmidt's beef-cube test, Winternitz's sajodin test, and Cammidge's test have now almost completely fallen into disuse.

Calcium oxalate crystals have been observed in the urines of patients with pancreatic disease, as in many other conditions, and there is nothing to indicate that

* Part I. appeared last week.

they have any special connexion with pancreatic lesions. Indicanuria has likewise been selected for notice in pancreatic disease, but whilst it is reasonable to assume that when there is a deficiency of protein-splitting ferment, there will be greater opportunities for the putrefaction of proteins by bacteria in the large intestine, there is no evidence that tests for indican are of any special value in suspected disease of the pancreas.

A similar attitude is justified in regard to tests for occult blood in fæces. A positive reaction indicates hæmorrhage somewhere in the alimentary tract. If clinically there is a carcinoma of the head of the pancreas, and blood is found in the fæces, there is a presumption, but no proof, that the growth is ulcerating into the bowel. E. C. Dodds and his colleagues have shown that the alveolar CO_2 rises during the secretion of gastric HCl and falls during the secretion of pancreatic juice, but the possibility of utilising this observation as an index of the output of pancreatic juice has not been explored. In any case the technique is too complicated to be used in routine clinical work.

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Reader in Chemical Pathology in the University of London; Chemical Pathologist to St. Bartholomew's Hospital.

Special Articles.

AN OUTBREAK OF SUPPOSED PSITTACOSIS

AT ASHTON-UNDER-LYNE, DURING FEBRUARY AND MARCH, 1930.

BY D. SAGE SUTHERLAND, M.D. GLASG.,
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With a Pathological Report

BY J. SHAW DUNN, M.D. GLASG.,
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Bacteriological Reports

BY H. B. MAITLAND, M.R.C.S. ENG.,
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THE occurrence of four closely related cases of acute illness in the same household, one of which proved fatal, following the death of a parrot in the same house, is so suspicious as to merit report in detail.

The parrot, described as a "festive Amazon," had been purchased during April, 1929. It was kept in the dining-room or the kitchen, and was stated to have suffered from catarrh and snuffles when purchased, but it appeared to be in fairly good health during the following summer. Its only abnormality was some shortness of breath when attempting to fly.

During January, 1930, it showed ill-health by ceasing to talk, and was very ill for a fortnight before its death on Feb. 23rd. There was said to be a muco-purulent blood-stained discharge from the nostrils, and the cook, who had cleared the nose with a match-stick "scores of times," placed the cage on the kitchen range for warmth. On the night of its death the owner, a medical man, had taken the cage to his bedroom and had got up to attend to the parrot. Its symptoms, in addition to the discharge from the nostrils, were hiccough and diarrhœa. The stools were loose and offensive, and contained blood. The feathers were ruffled and the wings drooped. It was morose, and became weak and very breathless before death. It was destroyed by cremation. There was no direct contact between the sick parrot and some other birds in an aviary in the house, and no illness among the small birds, although occasionally one was found dead. There is some evidence of indirect contact of these birds with other parrots. On March 17th, after the death of the parrot, the birds were certified by a veterinary surgeon to be in good health, but three were found dead a day or two later, and as a precautionary measure all the birds in the aviary were destroyed. There is evidence that the aviary was not kept with strict cleanliness, nor were rigid precautions taken against food and water being fouled by the birds. Before the arrival of the birds there were no mice; after their importation the house became overrun.

The cook states that during the winter months the parrot was frequently kept in the kitchen, and that she cleaned the cage and fed the bird. She took precautions in washing her hands before handling the household food, and was careful to see that the parrot did not contaminate food which was being cooked or consumed in the kitchen. The housemaid is said to have been afraid of approaching the bird closely.

The individuals who came most intimately in contact with the parrot were the cook and the owner, Case 1, who fondled and petted it a great deal. On Feb. 25th, two days after its death, he became ill. He had suffered from influenza some years before, and his symptoms in this illness were much more acute and sudden than he would have expected from an attack of influenza. He had been in a very debilitated state of health, due to the heavy demands of his practice, which to some extent may account for his infection. The second patient, who fell ill seven days later, was 63 years of age, and suffered from asthma. On account of his acceptance of the mayoralty of the town in the previous November, he found his public duties, added to his professional work, a severe strain, and this was further increased at the time by the medical care of his son. He had suffered from what was considered to be an attack of influenza on Feb. 6th, and attended a banquet while unwell. His indisposition lasted several days. It has been suggested that the parrot may have been infected from this illness, but it is known that the parrot was definitely ill before. It is noteworthy that, with the exception of Case 1, the infection selected the older members of the household, and the incidence does not suggest that infection was conveyed by food.

Clinical Reports.

CASE 1.—A medical man, aged 32, fell ill on Feb. 25th, 1930, two days after the death of a parrot. He suffered from chills, severe frontal headache and vertigo, and on the following day remained in bed, his temperature being 101° F. He can recall his own symptoms at the onset only of his illness, and states that he felt dazed and irritable. He was medically attended by his father and nursed by his mother, his wife, and the nurse-dispenser, with all of whom he came in close contact. After his father was taken ill on March 4th he was looked after by his uncle, also a medical man, who reports that the headache was very severe and that the patient suffered from photophobia and intolerance of noise. There was great irritability. The tongue was coated and the face pale. On March 4th the temperature was 103° F., the pulse-rate 96, and the respiration-rate 24. There was impaired resonance with fine crepitations at the right pulmonary base behind. Cough and expectoration were absent at this time. The patient complained of flatulence, and the abdomen was distended and tympanitic. There was no abdominal tenderness or enlargement of the liver or spleen. No rash was noted. The bowels were constipated and the urine contained a faint trace of albumin. Two days later the temperature was 102° F., the pulse-rate 90, and the respiration-rate 24. The patient was seen in consultation with Dr. Crighton Bramwell, who found impaired resonance and crepitations at the right base, and some loss of resonance in the axilla, but no bronchial breathing. On March 7th the temperature was 101·8° F. The tongue was still furred, and there was slight epistaxis. The general condition remained the same. He was seen by me on the afternoon of this day, and I noted loss of resonance in the right lung. Cough was very infrequent and there was no expectoration. The face was pale and sallow. The tongue was thickly coated.

The general appearance was of marked toxæmia. The patient was listless, feeble, restless, and suffered from nausea. Stools were loose and offensive. There was marked decubitus. The mental condition was then quite rational, but he was reported to have been rambling and incoherent. On March 8th he felt slightly better, but the temperature was 104° F. He felt relief after coughing up some jelly-like material. The headache, which up to now had been prominent, was less, and appetite was returning. On March 9th he had slept well, and felt much better. He was admitted to Monsall Hospital in the afternoon. His temperature was 102° F. on admission, and on the following afternoon it subsided to normal. The acute period of his illness extended to 14 days.

Bacteriological Report (H. B. M.)—Serum (collected March 7th, 1930) did not agglutinate "H" suspensions of *Bacillus paratyphosus* A, *B. paratyphosus* B, *B. paratyphosus* C, *B. aertrycke* (Mutton), *B. enteritidis*, or *B. abortus*. *B. typhosus* was agglutinated to a titre of 1 in 320. "O" suspensions of *B. typhosus* and *B. paratyphosus* B were not agglutinated. Blood (collected March 11th) was inoculated into two budgerigars and two mice, which remained well. Cultures of fæces and urine did not reveal any pathogenic intestinal bacteria.

There was no evidence for or against psittacosis. The illness was apparently not caused by any of the pathogenic intestinal bacteria. The agglutination of *B. typhosus* is not considered significant.

CASE 2.—A medical man, father of Case 1, aged 63 fell ill on March 4th nine days after the death of the parrot and seven days after the commencement of his son's illness. He had previously suffered from bronchial asthma and attacks of dyspnœa. The invasive symptoms were chilliness, pains in the limbs, severe headache, and slight epistaxis. On March 5th his temperature was 102·4° F. On the following day he had a very severe paroxysmal cough. He complained of severe pain in his temples, especially on coughing, and had some diarrhœa. The stools were offensive and slimy, but did not contain blood. The tongue was thickly coated.

When seen by me on March 7th he was propped up in bed and was very restless, muttering, and delirious. He was only able for brief intervals to collect his ideas sufficiently to give rational answers. Very fine crepitant râles were noted in both bases. The respiration-rate was not accelerated and there was no expectoration. He had slight cough, which was not unduly troublesome. The pulse-rate was 100. There was no abdominal distension. Two days later, on March 9th, when admitted to Monsall Hospital, the temperature was 101° F., pulse-rate 122, and respiration-rate 36. The urine contained a faint trace of albumin. The tongue was coated and the skin flushed. The heart sounds were regular, but the first sound somewhat muffled. There was a moderate degree of arterio-sclerosis. Expiration was prolonged over both lungs, but vocal resonance was normal. There was no abdominal distension. The patient was talkative and rambling, but slept for short intervals during the night. On March 10th the temperature was 102·8° F., the pulse-rate 120, and the respiration-rate 34. He was still restless and delirious, and spent a very disturbed night. The tongue was furred, dry, and covered with sordes. On March 11th his condition was distinctly worse. There was definite pallor and cyanosis. The temperature showed little change and restlessness was more marked. There was scattered bronchitis, but no definite consolidation. During the following night he was so collapsed that his friends were sent for. There was distinct evidence of failing circulation and commencing terminal hypostatic pneumonia. Before death he relapsed into a state of low muttering delirium, with irregularity of pulse and with occasional consciousness. His temperature at midnight was about 101° F. He died on the morning of March 13th.

At the commencement of his illness it was his opinion that he became infected from his son, whom he attended, and that the disease in both instances was contracted from the parrot.

Bacteriological Report (H. B. M.).—Serum (collected March 7th, 1930) did not agglutinate "H" suspensions of *B. typhosus*, *B. paratyphosus* A, *B. paratyphosus* B, *B. paratyphosus* C, *B. enteritidis*, or *B. abortus*. *B. aertrycke* (Mutton) was agglutinated to a titre of 1 in 40. "O" suspensions of the above first three organisms were not agglutinated. No pathogenic intestinal bacteria were found by culture from the fæces or the urine (obtained post mortem).

The disease was apparently not caused by any of the pathogenic intestinal bacteria.

Autopsy Report (J. S. D.).—There is a fairly thick layer of fat. The muscles are well developed and of good colour. The pericardium is normal and contains no fluid. There is a large soft ante-mortem clot in the right ventricle and pulmonary arteries. In addition there is much soft red post-mortem clot filling the right auricle and ventricle; the left side is almost empty. The valves are normal and the myocardium is of healthy aspect. The heart is of about normal size and weight. The aorta shows moderate atheroma throughout. The right pleura shows a small adhesion at the apex and a broad fibrous adhesion to the diaphragm, but no recent pleurisy. The right lung is well aerated and free from consolidation; there is some general congestion and very slight œdema posteriorly. The left pleura has a small fibrous adhesion at the apex but no recent pleurisy. A sector of the upper lobe of the left lung anteriorly is somewhat collapsed. On section there is consolidation of the anterior and upper two-thirds of this lobe, while the posterior part shows only slight œdema. The consolidation is red-grey in colour and nowhere as firm as in lobar pneumonia. Its margins are ill-defined and it lacks uniformity, reaching maximal intensity in the front of the lobe and in an area 5 by 7 cm. at the apex; at the latter site there is also much œdema. The lower lobe is

FIG. 1. FIG. 2.

Temperature charts in Case 1 (March 9th to April 1st) and Case 2 (March 9th to 13th).

well aerated and shows only slight hypostatic œdema. The trachea is normal, apart from some patchy congestion. The larger bronchi contain some mucus but present no apparent lesion. In the small intestine there is no special congestion of the mucosa and no ulceration. The Peyer's patches are atrophic and invisible. In the submucosa of the upper two metres of the jejunum there are about a dozen small circumscribed bodies of pale yellow colour. They measure 2 to 5 mm. in diameter and are of soft consistence suggesting small abscesses (? chyle cysts). The omentum contains much fat. The liver is of about normal size; on section it is generally pale with slight nutmeg appearance; probably fatty infiltration. The spleen is about twice the normal size, tumid, and fairly firm. The pulp is dark red and full, scraping out on the knife. The mesenteric lymphatic glands are small and inconspicuous, of normal aspect. The pancreas is normal, apart from some adiposity. The kidneys are of normal size and the capsules slightly adherent. The surface is finely granular from arterial atrophy, but there are no hæmorrhages or other apparent lesion. The urinary bladder shows only very slight congestion of the mucosa. The prostate is fairly large and fleshy. The pia arachnoid is thin and transparent, and there is a slight excess of clear fluid but no special congestion of pia or grey matter. The puncta cruenta are fairly prominent on section, but there are no hæmorrhages.

The other structures appear normal.

Histological Report (J. S. D.).—In the more solid parts of the pneumonia the *lung* alveoli are filled, though not distended, by fibrino-cellular exudate. The cells are mainly neutrophile polymorphonuclear leucocytes and are usually not in large numbers. Red blood corpuscles occur in the exudate in places. Towards the margins of the solid patches, where consolidation is less dense, there is less fibrin and more residue of œdemic fluid. In these parts the congested capillaries of the alveolar walls frequently show small hyaline thrombi. Sections stained by Gram's method and by Leishman's stain have been examined but no cocci resembling pneumococci or other organisms have been found in any part. While this does not exclude the presence of such organisms, it would suggest that they must, if present, be in small numbers. The medium and larger blood-vessels in the consolidated areas are free from thrombus. The bronchioles in the pneumonic areas show some desquamation of epithelium and occasional accumulations of polymorphonuclear leucocytes. There is also some

congestion of the vessels in their mucosa, but no cellular infiltration. The appearances are not such as to suggest a primary bronchial lesion, as the inflammatory changes are not more advanced in the bronchioles than in the lung, nor is the pneumonia more advanced immediately around the terminal bronchioles than at the peripheries of the lobules. The bronchi in the non-consolidated areas and one of the main bronchi, separately examined, show desquamation of epithelium, which is no doubt due to post-mortem autolysis.

The *liver* lobules show moderate congestion of the central sinusoids and slight fatty infiltration at the periphery In almost every lobule there is a focus of necrosis of liver cells varying in size from about 1/10 to about 1/2 of the lobule area. These foci are always near the centre of the lobule and are usually confined to one quadrant; larger ones appear to surround the central vein. In these areas the dead cells have slightly shrunken protoplasm which stains strongly with eosin; the nuclei have disappeared. The sinusoids between the dead cells contain fairly numerous polymorphonuclear leucocytes and occasionally small adherent eosinophil thrombi. No organisms are recognised in relation to the necrosed areas.

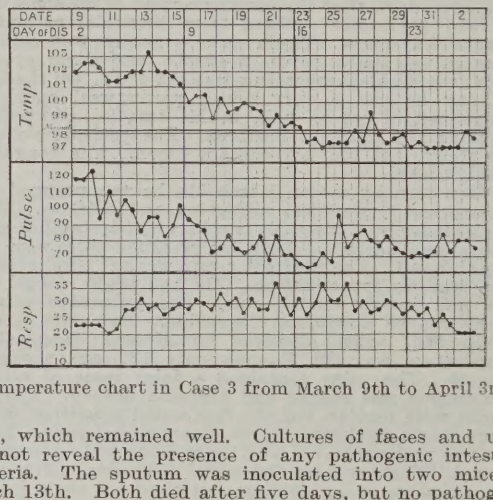
The only notable feature of the *spleen* is a loading-up of the pulp with red blood corpuscles, giving an appearance of diffuse hæmorrhage in places. Leucocytes are present in small numbers, but there is no appearance of large mononuclear cells such as accumulate in the spleen in typhoid affections. No definite coccal or bacillary organisms are found in films stained by Leishman's stain in sections stained by Gram or Leishman's stain. The films of *bone marrow* show abundant myelocytes and leucocytes, but no definite departure from normal. The glomeruli of the *kidney* are slightly congested. The tubules show some early post-mortem autolysis but no necrosis or other definitely pathological change. In the parietal cerebral cortex and mid-brain there is more congestion of the vessels than was assumed from naked-eye examination. No certain pathological changes can be made out in any part.

Summary.—The main features are the pneumonia in the upper lobe of the left lung and changes in spleen and liver which point to an infection with toxæmia. There is nothing definite to suggest an intestinal infection. The pneumonia is not quite of the usual type. It has the main histological features but not the characteristic gross distribution of a lobar pneumonia. On the other hand, it does not suggest a lesion disseminated by the bronchi, being confined to segments of one lobe and showing no histological evidence of a primary bronchiolar lesion.

CASE 3, the wife of Case 2 and mother of Case 1, was aged 62. She had as premonitory symptoms, malaise and langour for a few days, and took to her bed on March 8th. She complained of severe headache and slight epistaxis and of feeling tired and shivery. The temperature was 103° F. There were no physical signs in the chest or abdomen and her sleep was undisturbed. She was admitted to Monsall Hospital on March 9th. There was a previous history of fairly good health. On admission the temperature was 102° F., pulse-rate 120, and respiration-rate 24. At 2 o'clock on the same morning the temperature was 101·4° F., pulse-rate 84, and respiration-rate 28. The tongue was heavily furred and dry. There was some stomatitis. The heart sounds were regular. Examination of the chest showed no obvious abnormality. She was somewhat constipated, but had no distension, tenderness, or rigidity of the abdomen. On March 10th the temperature was 103° F., pulse-rate 126, and respiration-rate 24. She had a fairly good night, but complained of slight headache and malaise. The bowels were opened after an aperient. The stools were greenish in colour and offensive, without mucus or blood. The tongue was heavily furred. An occasional moist râle was heard in the left lower lobe of the lung. The heart was noted to be slightly irregular in rhythm, with a reduplication of the second sound. On March 11th the temperature was 102° F., pulse-rate 112, respiration-rate 20. The urine contained a trace of albumin. There was shortness of breath and slight headache.. The face was flushed, and of a dusky toxic appearance. On the 12th she had slept little. The tongue was dry and in the left lower lobe numerous moist râles were heard. An occasional moist sound was audible at the right base. The heart was still irregular and the urine contained a dense cloud of albumin. There was a very marked loss of appetite. On the 13th the temperature was 103·2° to 102° F., the pulse-rate 88, and the respiration-rate 32. She slept for only one hour. The stools were loose and pea-soupy in character and there was severe diarrhœa, the bowels being opened 14 times in 24 hours, with some incontinence both of bowels and urine. After digitalis the heart sounds became more regular and of better quality. On March 14th, after restriction of diet and the administration of pulv. cret. aromat. c. apio, the diarrhœa became less; the patient slept better. On the 15th the temperature had fallen to 101° F. and she felt more comfortable, but continued to be somewhat dazed and apathetic and answered questions with hesitation. Cough was very slight. The urine contained a heavy deposit of albumin. From the 16th to the 23rd the temperature subsided gradually to normal. The stools were normal and the urine contained a faint trace of albumin. The pulse-rate dropped to 72 per minute. Vocal resonance was normal on the 18th, but a few scattered crepitations were still audible. Slight œdema of the right ankle and foot was observed. On the 19th her temperature did not exceed 100° F., but her general condition was still poor and occasional irregularity of the pulse was noted. She was feeble, and answered questions slowly. The tongue was still heavily furred. On the 20th there was œdema of both ankles. The skin was dry and appetite poor. A blood count made on this date showed: red blood corpuscles, 5,003,000; white blood corpuscles, 8000; polymorphonuclear leucocytes in excess; hæmoglobin, 70 per cent. On the 21st the temperature was 99° F., pulse-rate 64—volume and tension poor—and respiration-rate 32. She was still very drowsy and indifferent. On the 22nd the temperature subsided to normal and the general condition was slightly improved. The pulse was more regular and the tension better. Mentally she was rather brighter. On the 23rd she was reported to be distinctly improving. There continued to be a faint trace of albumin in the urine.

Bacteriological Report (H. B. M.).—Blood (collected March 11th) was inoculated into two budgerigars and two

FIG. 3.



Temperature chart in Case 3 from March 9th to April 3rd.

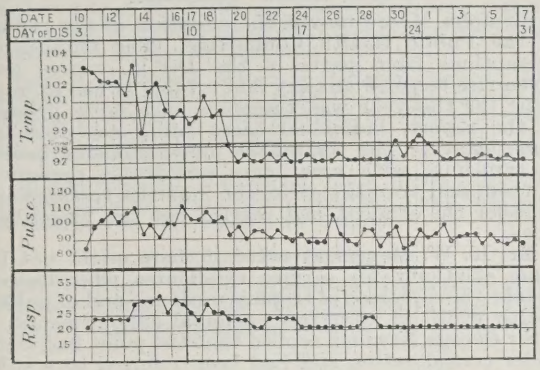
mice, which remained well. Cultures of fæces and urine did not reveal the presence of any pathogenic intestinal bacteria. The sputum was inoculated into two mice on March 13th. Both died after five days, but no pathogenic bacteria were isolated from them. No pneumococci or hæmolytic streptococci were detected in cultures of the sputum.

There was no evidence for or against psittacosis. The disease appeared not to be caused by any of the pathogenic intestinal bacteria.

CASE 4.—A nurse dispenser, aged 50, states that she had felt tired for some days, although she continued to carry on her duties. On March 8th she was troubled with headache, backache, pains in the limbs and occasional shivering, and remained in bed. On March 9th she suffered from diarrhœa, and from the 10th there was some bleeding from the nose. On admission to Monsall Hospital on March 10th her face was flushed, her temperature was 103° F., and she had severe headache, but no abdominal distension. The spleen was not enlarged. Some moist râles over the anterior surface of the right lung were noted, and also some fine crepitations over the left base, but there was no loss of resonance. The heart was normal. On the following day the tongue was coated, the temperature 102° F., the pulse-rate 98, and the respiration-rate 24. The face was still flushed and there was severe frontal headache. She was very depressed. Diarrhœa had ceased and cough was absent. There was an herpetic eruption on the upper and lower lips, and twitching of the facial muscles, but the reflexes were normal. On March 12th the temperature was 102·5° F., pulse-rate 108, and respiration-rate 24. Headache had disappeared. The face was still flushed. On March 13th the temperature was 103·4° F., and the pulse-rate 108. There was some slight headache and cough and the tongue was still thickly coated and flabby. There was some loss of resonance and harsh crepitations at the right base behind, also some fine crepitations below the left scapula. On the 14th there was a morning remission of temperature to 99° F., and in the afternoon it was 101·8° F. On the 15th

the temperature was 102° F., pulse-rate 98, and respiration-rate 32. The stools were relaxed. There was a short dry cough, but no expectoration. The face was still flushed. The mental condition remained clear. There was some impairment of resonance at the right base and the tongue was furred. The slight facial twitching was now absent. The skin was moist and the headache was very much less. The stools were loose and the motions offensive. On the 17th

FIG. 4.



Temperature chart in Case 4 from March 10th to April 7th.

slight blood and mucus were reported in the stools and the tongue was still coated. The temperature had fallen to 99·5° F.; the pulse-rate was 104, and the respiration-rate 26. The face was less flushed. On the 18th the stools were frequent and relaxed, normal in colour, with no blood or mucus or abdominal distension. Cough had ceased. The tongue continued to be furred on the dorsum, but clean at the edges and tip. The heart sounds were regular. No albumin was noted in the urine. She made some complaint of weakness, and on the 19th lassitude was very marked, but the appearance of the stools approached normal and the bowels were open 4 times in the 24 hours. On the 20th the temperature fell to normal. The tongue was less furred and the patient felt better generally. A blood count showed: red blood corpuscles, 4,080,000; white blood corpuscles, 8000; hæmoglobin, 70 per cent. A differential count showed: polymorphonuclear leucocytes, 65 per cent.; large lymphocytes, 10 per cent.; small lymphocytes, 25 per cent.

Bacteriological Report (H. B. M.).—Blood (collected March 11th) was inoculated into two budgerigars and two mice, which remained well. Cultures of urine and fæces did not reveal the presence of any pathogenic intestinal bacteria.

There was no evidence for or against psittacosis. The disease was apparently not caused by any of the pathogenic intestinal bacteria.

Commentary.

All the cases show a somewhat remarkable parallel in their symptomatology, which corresponds with that of cases recently described in the medical journals as parrot disease. All suffered from an acute infection of a toxæmic nature and of sudden onset, associated with pyrexia, severe headache, chills, coated tongue, slight cough, epistaxis, and anorexia, and in all cases there was some pulmonary involvement of an indefinite nature. Defervescence showed a very gradual and regular decline, with absence of morning remissions. The pulse-rate was at no time greatly accelerated in relation to the temperature. At some period diarrhœa was a feature to a greater or lesser extent, and was sometimes associated with abdominal discomfort or distension. There was no splenic enlargement or rash. A dazed appearance, mental torpor, and a tendency to cyanosis was present in all. Muttering delirium and insomnia were features of the most acute period of the illness. Marked prostration resulted and convalescence was slow.

While the features of the four cases described are indistinguishable from influenzal pneumonia, catarrhal symptoms at the onset were not a prominent feature and pulmonary involvement was late. Moreover, these cases occurred when influenza was not prevalent, no other member of the household or relation suffered from an influenzal illness of a more benign type, and the weight of the clinical evidence tends to the opinion that these illnesses were in some way definitely associated in ætiological relationship or had some common source of infection. On the other hand, there is evidence which cannot be overlooked, that the acute illnesses were fortuitous and due to an independent source of infection unconnected with the parrot. The occurrence of exceptional cases of illness of an influenzal nature in four of the less resistant individuals of the household, predisposed by age or other cause, at the coldest period of the year, may be considered not improbable. The absence of a definite organism, or the presence of a specific virus common to the four cases, lends weight to this view. The post-mortem appearances in the fatal case bear some resemblance to fatal cases observed elsewhere associated with parrot disease. Presuming that the parrot had suffered for a considerable period from infective disease communicable to man, it is difficult to explain why these cases should have occurred in such close relationship to one another, unless it be presumed that the disease is capable of being communicated from human sources, and that the first victim infected the other members of the family. Fatal disease in parrots may exhibit similar symptoms, although due to varying causes, and there may be more than one disease in parrots which is infective to man. There is the further possibility that a parrot may be susceptible to human influenza, and that the virulence may be increased by animal passage. Increased virulence may account for the frequent occurrence of severe influenzal attacks in association with sick parrots. The destruction of the parrot rendered it impossible to obtain any definite scientific evidence of the nature of the disease in the parrot, and consequently, in the absence of further proof, it would be unwise to dogmatise regarding the definite nature and source of infection of these illnesses.

MEDICINE AND THE LAW.

A PARTNERSHIP DISPUTE.

THE almost invariable lesson of litigation over a medical partnership dispute is that dragging the matter into the law-courts has done nobody any good. Excessive publicity is usually given to domestic and personal details which are not really of public interest; accusations are made which, even if rebutted, leave unpleasant recollections; money is spent which could have been turned to better use; finally, the medical profession as a whole receives an advertisement of a kind which it does not greatly desire. Such a dispute has lately been occupying several days of the time of a judge of the Chancery Division. Two practitioners, nearly 60 years of age, evidently found further coöperation impossible after two and a half years of partnership. One of them served the other with a notice purporting to dissolve the partnership and removed the other's name from the surgery during his absence. The other doctor thereupon applied to the High Court for an injunction restraining his partner from excluding him from the partnership premises; he asked also for a declaration that the notice for termination of the partnership was void and he finally requested the Court to dissolve the partnership. The defendant doctor alleged gross neglect and breaches of the partnership articles. He too asked that the judge should order a dissolution. As this was what both parties desired, some simpler and less expensive remedy than litigation might well have been found. But the allegations of neglect naturally were an obstacle to peaceful settlement; moreover, the partnership agreement attached pecuniary consequences to a dissolution; in effect (it was stated), if the defendant were entitled to a dissolution, he would have to pay the plaintiff £450; if the plaintiff were in the right, the defendant would have to pay £1500. Mr. Justice Bennett had to decide whether the plaintiff (1) had grossly neglected the

business of the partnership, or (2) had committed a breach of the articles so as to entitle the defendant to expel him from the partnership. This involved examining evidence about two classes of acts on the part of the plaintiff—namely, acts of alleged negligence in connexion with patients and conduct calculated to lead patients to think lightly of the defendant by criticising in hostile or contemptuous words the defendant's diagnosis or treatment. In any event, it will be observed, it was the plaintiff's conduct which was in question although it was the plaintiff who initiated the proceedings. The judge came to the conclusion that the defendant doctor failed to prove that the plaintiff had deliberately and intentionally made such criticism as was alleged; "I do not think," he said, "that the plaintiff at any time intended to be disloyal to his partner." The other part of the case was more difficult. There had been an allegation about a little girl on whom it was afterwards found necessary to perform an urgent operation for appendicitis. Here the judge considered that the plaintiff's conduct had fallen short of the standard which the parents and the partner had a right to expect. Another allegation related to a refusal to go out at 1.45 A.M. to attend to a patient; this, in the circumstances, the judge held not to be necessarily gross neglect of the business of the partnership. A third incident concerned a refusal to attend a patient at 9 P.M. some six miles away; the plaintiff's explanation was that it was one of the defendant's patients, that the defendant was known to be returning in half an hour and that it was proper to leave the case to be dealt with on his return. The judge held that the plaintiff refused to go and see the case because at that stage of the partnership he was not disposed to turn out late at night to see one of his partner's patients; "no doubt the plaintiff's temper got the better of his judgment." These incidents, in the judge's opinion, amounted to this: there was one case of neglect by the plaintiff and one case in which his loss of temper led him into an error of judgment. Mr. Justice Bennett did not think that one act of negligence or one error of judgment could be interpreted as gross neglect of the partnership business. Taking the case as a whole, he was not prepared to say that the plaintiff had been guilty of gross neglect. The clause in the articles required proof of some regular course of careless conduct or something of the nature of wilful neglect. This proof was wanting. The plaintiff consequently succeeded in his action; the defendant was not entitled to expel him. At the same time it was clearly a case in which it was quite impossible for the partnership to continue; the court would, therefore, decree a dissolution. The defendant was ordered to pay the costs of the action except those of the two items on which the plaintiff had been found at fault.

The inevitable question arises—why was this unfortunate litigation not avoided? Ample opportunity exists for settling such disputes by arbitration. Partnership articles can provide for such settlement and, what is more important, partners must realise that it is their duty to their profession to avoid washing their dirty linen in public. The Chancery Division has perhaps never had better judges than at this moment. Mr. Justice Bennett, in particular, with his early training at the common law, is the ideal judge for an issue of disputed fact. But the recent case remains on record as an instance of litigation which is better avoided. The first method of preventing such incidents is to take more care in entering upon a partnership between persons whose temperaments may be incompatible. No medical partnership can be carried on satisfactorily unless there is mutual goodwill between the partners. The second is to settle the affair quietly before some arbitrator in whom all parties can repose trust and thus to avoid taking the whole world into one's confidence. It is well for any partnership agreement to contain a clause that any question, dispute, or difference shall be settled by arbitration.

GENERAL MEDICAL COUNCIL.

SUMMER SESSION, MAY 27TH–31ST, 1930.

(*Concluded from p. 1263.*)

COMMITTEE BUSINESS.

Public Health Committee.

Sir John Moore moved the adoption of the report of the Public Health Committee. The number of exemptions from parts of the D.P.H. course had given rise to some anxiety and a table of the exemptions for the year was therefore once more printed in the report, individual cases being described at some length. The committee urged licensing bodies to scrutinise with great care certificates presented to them and to make stringent inquiries to ascertain whether the student had carried out the prescribed rules.

Mr. K. W. Monsarrat asked if there might not be some elasticity for service candidates who desired to take the diplomas of tropical medicine and of public health while on leave from colonial appointments.

Sir George Newman replied that the point had been under consideration and had been referred to a subcommittee. Meanwhile every case was most carefully considered on its personal merits with regard to the actual experience and position of the applicant. It must, however, be clearly realised that the diploma of public health had been instituted for persons seeking posts in this country and that experience of public health duties abroad, however valuable, was no substitute for the special knowledge required here.

Pharmacopœia Committee.

Dr. H. H. Dale introduced the report of the Pharmacopœia Committee, which recorded that 1955 copies of the British Pharmacopœia, 1914, had been sold in the year ending May 24th, 1930. The committee had completed the task of considering additions to the Pharmacopœia. They had been guided by the following general principles:—

(*a*) They have accepted the opinion expressed by the Committee on Civil Research, Subcommittee on the British Pharmacopœia, that "the British Pharmacopœia should contain only those standard articles which are in general use throughout the Empire. Where it is desired that official recognition should be given in any part of the Empire to any local drugs or local substitutes, we suggest that this should be left to the Governments concerned, which, by means of supplements or addenda to which they may accord the necessary sanction, can meet any local requirements or introduce any modifications or alternatives desired."

(*b*) In the case of groups of substances containing the same or similar active principles—e.g., vegetable substances containing tannic acid—it has been thought advisable to reduce the number of drugs described.

(*c*) Certain substances which are little used or are believed to be of doubtful therapeutic value have been omitted.

(*d*) Preparations such as the hypodermic injections and certain of the "liquors" have been omitted on the ground that standard formulæ are not necessary, and that it is preferable that potent drugs should be prescribed by the physician in quantities by weight as required.

Special formulæ for suppositories have been omitted and a general method will be described, leaving to the discretion of the physician the dosage of the medicament to be incorporated. Formulæ for several mixtures and for some of the compound pills and powders have been omitted.

It had thus been possible to reduce the number of substances described and to make room for more precise tests of purity and for biological tests and other new information. The Pharmacy Subcommittee had nearly finished a systematic review of those galenical preparations which will be described in the new volume and had made good progress with the definition of new preparations. The subcommittees dealing with special drugs had presented a number of monographs to the Commission. Progress had been made with the question of vitamin tests and an investigation into a standard colour test

for cod-liver oil had been initiated. A survey of the nomenclature had been made with a view to bringing it into line as far as possible with the International Agreement and the United States Pharmacopœia. The text of the International Agreement appeared as an appendix to the report.

Executive Committee.

At the meeting of this committee immediately preceding the meeting of the Council the Registrar reported that the following names had been restored to the Register from which they had been erased under Section 14 of the Medical Act.

John M. Bickerton, Arthur F. R. Dove, Percy L. Hope, Thomas J. McCarthy (I.), Grace C. C. Mackinnon (S.), William A. Malone (I.), Sylvia Marsh (I.), David Morrison, Daniel J. Mulholland, Thomas S. Reeves (I.), Annie E. G. Rowlands, Laurence A. Waddell (S.), John F. W. Waters.

It was resolved to raise the price of the office copy of the Medical Register to 10*s.* and that this price be charged to the Stationery Office.

THE NEW VOTING PAPER.

Sir Holburt Waring presented the report of the Finance Committee on the question of the voting paper.[1] The proposed new form is shown below.

ELECTION OF DIRECT REPRESENTATIVES FOR ENGLAND, 19 .

MEDICAL ACT, 1886.
(49 and 50 Vict. c. 48.)

ELECTION TO THE GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION OF THE UNITED KINGDOM BY REGISTERED MEDICAL PRACTITIONERS RESIDENT IN ENGLAND.

BALLOT PAPER.

..... Vacancies.

The Registered Medical Practitioner voting must put a mark thus X against the name or names of the candidate or candidates for whom he votes.

Column for the Voter's Mark X.	Names of Persons Nominated.	Registered Address.	Registered Qualifications.
	A. B.		
	C. D.		

1. Each Voter shall mark the Voting Paper delivered to him with a X against the name or names of the person or persons (not exceeding the number of persons to be elected) for whom he intends to vote. Any mark placed on the Voting Paper by which the Voter may be afterwards identified renders the vote invalid.
2. The Voting Paper must be folded face inwards.
3. The Voting Paper must be placed inside the Identification Envelope.
4. The Identification Envelope must be securely fastened.
5. The Voter must sign the declaration printed on the identification Envelope.
6. The Voter must place the Identification Envelope inside the covering envelope.
7. The Voter must dispatch the covering envelope to , REGISTRAR, , and it must be received there on or before the .
8. If the Identification Envelope is transmitted by post postage must be prepaid.

No matter other than the Voting Paper should be placed inside the Identification Envelope.
Please examine the extract from the *Register* placed on the Identification Envelope and mark thereon any corrections you desire to be made. A form for the registration of additional qualifications will be sent on application.

Dr. Bone agreed that this was a great improvement, but thought the same formula should be used on the ballot paper as in No. 1 of the instructions. The President pointed out that the instructions 1–8 were laid down by the Privy Council and therefore obligatory. Dr. Bone therefore withdrew this criticism but still objected to the notes at the bottom of the page as irrelevant and unjustifiable, and suggested that there should be an indication that the instructions were to be torn from the ballot paper at the dotted line. It was agreed to add at the top a notice that the practitioner, before voting, should read the following instructions. The President pointed out that the first note at the bottom was a warning to the voter, in his own interest, as the ballot papers were not opened by the Registrar but kept until a fixed date.

[1] THE LANCET, 1929, ii., 1256.

ROYAL INSTITUTE OF PUBLIC HEALTH.

THIRTY-FOURTH ANNUAL CONGRESS.

THE Annual Congress of the Royal Institute of Public Health was held at Portsmouth from June 4th–9th, with Major-General J. E. B. SEELY as President, and the Lord Mayor of Portsmouth (Councillor J. E. SMITH) as Honorary President. The importance of the Navy and the Dockyard to the town was reflected in the scientific communications, for discussions on marine medicine and hygiene, including the industrial hygiene of dockyards, were prominent. Members of the Congress had the advantage of visiting the Royal Naval Hospital and H.M. Dockyard, and of going over a great ship.

Health of Men at Sea.

Presiding over the Services section, Surg. Rear-Admiral H. C. WHITESIDE, officer-in-charge Haslar Hospital, set out some of the problems of the seafaring doctor. Nowadays the difficulties of fresh water supply have been overcome in the Navy; every ship carries a distilling plant. The recruiting naval medical officer must be an efficient oculist, able to detect any visual defect, whether of refraction or of colour-vision. In tropical waters the doctor must pay great attention to the condition of the food, especially vegetables and fish. He must also be prepared to determine the potability of shore water used for any reason on board. In our great ships many of the ratings are, of necessity, troglodytes, living and working in enclosed spaces, perhaps unduly crowded, in spite of the special arrangements made to provide ventilation. When a wave of influenza occurs, we have the very best conditions for a manifestation of latent tuberculosis. In spite of all that is being done the Navy invaliding rate from tuberculosis is still too high. Surg.-Captain L. M. MORRIS pointed out the present need of the Navy for the more intelligent type of man. The smaller the Service the greater the care required in the selection of personnel. During recruiting much attention is paid to the candidates' temperament; the parent is asked to fill up a form in some detail, so that the recruiting medical officer can form an idea as to the mental health of the candidate, and the presence or absence of the temperamental qualities required for the Navy.

Dr. W. HANNA (Liverpool) considered that cadets and others who intend joining the mercantile marine should receive a training in hygiene on training ships, and qualify in ambulance and first-aid work; all should receive some instruction in the dangers of venereal disease. Any pamphlets on venereal disease intended for sailors should contain the necessary information, not isolated but incorporated with directions for the maintenance of general good health.

At the Royal Naval Dockyard, Surg.-Commander H. D. DRENNAN is responsible for the medical care of the workers. In addition to the medical examination on entry, a periodical examination is made of certain classes of workers. All lead workers appear before the medical officer fortnightly; during the two years Surg.-Commander Drennan has been in the Yard he has not come in contact with a single case of lead poisoning.

The vision of welders is tested monthly and of motor transport drivers yearly. Divers are medically examined every week, and before each dive of over five fathoms. The fresh water tank party are examined monthly and on each occasion before they enter tanks, the diseases especially looked for being enteric fevers, diarrhœa and dysentery, venereal and skin diseases, otorrhœa and pyorrhœa; the party wear canvas suits and gymnasium shoes. The excreta of workers who have suffered from enteric fever are examined in the Royal Naval Hospital on three occasions to prove their freedom from infection. When workers who have contracted tuberculosis are certified free from infection, employment is found for them in the open air or in large airy workshops. Dr. M. ASTON KEY (Portsmouth) praised the Dockyard arrangement whereby half the men employed were taken on permanently, thus taking away the awful shadow of the "sack." Excellent canteens are provided. It was a serious mistake for men living far away to scurry home to their meals midday; the extra time spent in rest was of distinct value.

Tropical Medicine.

Presiding over the Tropical section, Dr. J. B. CHRISTOPHERSON (London) discussed in his address motives in dress. Men's dress, owing to outdoor pursuits, and the necessity of defence against enemies, had developed principally along the lines of protection and utility; with women adornment had always been almost the entire motive. But the average woman would not be able to stand the tropics unless she clothed herself for health, convenience, and utility. Dr. G. CARMICHAEL LOW (London) hoped that the biochemical tests recently devised for the diagnosis of climatic bubo would be more widely used in order that their value might be determined.

State Medicine.

Presiding over the Section on State Medicine, Prof. H. R. KENWOOD emphasised the importance of the maintenance of adequate nutrition to keep up the resistance of children to infectious disease. Dr. C. KILLICK MILLARD (Leicester) proposed an improved and extended application of Mr. E. D. Simon's suggestion of rent allowances for children. To pay for these, Dr. Millard proposed that the rents of municipal houses should be increased all round by, say, 1*s.* 6*d.* a week. Additional sources of money would be a lodger tax and a tax on all children who were earning and living at home. He contends that such a scheme could be made self-supporting. The new Housing Bill (No. 2) by providing for differential rating would enable some such scheme to be adopted with local modifications. Dr. C. O. STALLYBRASS (Liverpool), in his paper on variation in virulence in the course of epidemics, said that modern tendencies had been to discount the importance of variations in the pathogenicity of the organism. He took diphtheria as a crucial example in which death was due to the potency of the diphtheria bacillus and not of the secondary invaders. Dr. Stallybrass adduced statistical, clinical, and bacteriological evidence that the diphtheria bacillus had varied in potency in the course of recent epidemics both in Liverpool and Czecho-Slovakia. In Prague Drs. Feierabend and Schubert had found that in strains of bacilli from fatal diphtheria in which antitoxin therapy had failed, the potency of the bacillus was increased. Investigation was required not only of each disease, but also of individual epidemics. Dr. R. J. BLACKHAM (London) called attention to the therapeutic value of lactic acid milk powders in the feeding of infants. Sir BRUCE BRUCE-PORTER (London) pleaded for the institution of honorary librarians in hospitals.

Tuberculosis.

In the Section on Tuberculosis Sir HENRY GAUVAIN (Alton) expressed his belief that healing resulted from constantly changing conditions of intensity of sunlight; abundance of sunshine was often not desirable in debilitated patients at the beginning of treatment. Dr. O. BERNHARD (St. Moritz) confessed to an uneasy feeling about placing patients with surgical tuberculosis among patients with the open pulmonary or laryngeal form of the disease; they were, he thought, more susceptible to droplet infection than the healthy. Dr. JAMES WATT (Godalming) suggested that slight cases of pulmonary tuberculosis whose career might be damaged by having been to a sanatorium, should be treated in a special ward at a convalescent home. Dr. JANE WALKER (London) who, she said, makes a point of employing delicate servants, finds that after they visit the local tuberculosis officer it is very difficult to get them to do any work; tuberculosis officers should not perpetuate the evils of the sanatorium. Councillor S. W. BEALES (Grimsby), finding it difficult to carry on the work of a tuberculosis care committee without a fund, had tried various ways of acquiring money, and had discovered that dances at dance halls, arranged on the 50-50 basis, were a fruitful source of income.

Industrial Hygiene.

Sir THOMAS OLIVER (Newcastle-upon-Tyne) presided over the Section on Industrial Hygiene. Dr. W. J. O'DONOVAN (London), after emphasising the multiple nature of cheiropompholyx, complained of the strenuous desire of patients and approved societies that panel and works' doctors should certify any dermatitis of the hands as due to occupation; county court juries are apt to look upon contrary medical evidence as hired perjury. Dr. PROSSER WHITE (Wigan) gave an interesting communication on sensitisation in the diagnosis of the traumatic dermatoses which should be studied in the unabbreviated form. Dr. H. M. VERNON (Industrial Health Research Board) dealt with warming by the panel system of low temperature radiation. Concealed hot-water pipes and electrical heating by means of insulated wires embedded in plaster in the ceiling had been used for some time; a more recent method was to pass a current through a zig-zag ribbon layer of graphite material embedded in the lower side of fire-clay plates suspended 10 feet above the floor.

Mosquito Control.

A visit was paid to the British Mosquito Control Institute on Hayling Island. Here for ten years Mr. J. F. Marshall has been carrying on scientific work to help local authorities and private individuals to exterminate biting mosquitoes in this country. British mosquitoes comprise 26 species—three anophelines and 23 culicines; about three-quarters of these species bite, especially at night in hot, stuffy weather. Five species breeding in fresh water are common, the others are rare. In most inland places six species of mosquito are found; at the seaside the number is brought up by the addition of two other species which breed in salt water. The seaside is worse than inland for two other reasons—mosquitoes breed better in salt water; these salt-water mosquitoes can fly further than fresh-water species. In view of the forthcoming visit of the British Medical Association to Winnipeg, it is of interest to know that a strenuous anti-mosquito campaign is being carried out there.

The amenities of Southsea with its open common and pleasant gardens, the view of a sea crowded with its liners, yachts, and battleships, the harbour, and the forts, contributed largely to the success of the Congress.

ST. BARTHOLOMEW'S HOSPITAL, ROCHESTER.—This hospital last year admitted 2038 in-patients who cost £8 0*s.* 8*d.* each. The 9521 out-patients cost 7*s.* 1*d.* each. The reconstruction of the out-patients' department, including a separate casualty department with theatre, and an enlarged X ray department, will be completed during the present year. There was a deficit in 1929 of £2338, which brings the total debt on the general maintenance fund to over £14,000.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

The Ideal and the Real in Public Health.

THE Governor of New York, Mr. Franklin D. Roosevelt, has announced the appointment of a special health commission to study the public health law and to make an appraisal to determine the possibility of a more effective application of the latest results of scientific research in preventing disease and conserving health. In making the announcement, the Governor quoted from the speech of Dr. William H. Welch delivered at the recent celebration of his eightieth birthday in Washington: "While public health is the foundation of the happiness and prosperity of the people and its promotion is recognised as an important function of government, how wide is the gap between what is achieved and what might be realised; how inadequate is the understanding of the public concerning the means adopted to secure the best results." Mr. Roosevelt said that it was his intention to reduce this gap.

The chairman of the new commission is Dr. Livingston Farrand, the President of Cornell University. He is supported by a very strong commission composed not only of prominent medical men such as Dr. Linsly Williams and Dr. Simon Flexner but also by lay experts in public health administration and successful business executives. The commission is charged to submit "any conclusions and recommendations which it may deem wise relating either to the legislative or administrative aspects of public health."

Prevention of Blindness.

On May 24th the Leslie Dana Gold Medal, which is awarded annually in recognition of "the most outstanding work in behalf of prevention of blindness," was presented to Dr. George E. de Schweinitz, of Philadelphia. The presentation address was made by Dr. Franklin Royer, medical director of the National Society for the Prevention of Blindness, which has just published its fifteenth annual report. Its efforts now seem to be very largely directed to removing the handicap of defective vision. Forty-five sight-saving classes have been inaugurated during the year, making a total of 350 such classes now in existence, in 95 cities of 21 States. Through the use of large type books, movable desks, ideal lighting, and special teaching methods children with visual defects are given a full education and at the same time learn how to conserve their remaining sight. The Society estimates that approximately 5000 such classes are needed. To train teachers for this work special courses will be given during the coming summer term at various universities.

A Competition for Cities.

The awards are announced of the first annual health contest sponsored by the U.S. Chamber of Commerce. The 108 competing cities were divided into five classes accordingly to population, and the five winners are Milwaukee, Syracuse, N.Y., East Orange, N.J., White Plains, N.Y., and Sidney, Ohio. The primary object of this competition was to assist in reducing economic losses in the United States due to unnecessary illness and death, through the activities of local chambers of commerce or similar associations in coöperation with their official health agencies. The ratings were based upon the answers to a fact-finding schedule, copies of which were sent to the health officers of the contesting cities. The main factors considered in grading were the organisation and equipment of local health departments; financial support of health work, both official and voluntary; facilities for health information and education; water-supply; milk-supply; sewage disposal; and health laws and ordinances. The United States Chamber of Commerce hopes to continue the contest from year to year. From the local standpoint this offers a helpful yardstick for the measurement of actual accomplishments with the possibility of gaining national recognition and is of special benefit in enlisting the interest of the leading business interests in promoting efficient city health administration.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

B C G.

IN Ujpest, a factory town adjacent to Budapest where hygienic conditions leave much to be desired, there is a considerable death-rate from tuberculosis. About two years ago, encouraged by the good results obtained with Calmette's vaccine, Dr. Rudolf Dvorcsák, senior physician of the tuberculosis dispensary of the Social-Political Institution, began to give it to selected infants in the town. Only those children were chosen who undoubtedly lived in an infected environment, and could easily contract the disease. Of several hundred infants treated five or six have died with manifest tuberculosis. In one case where both father and mother were tuberculous the six eldest children are alive, whereas the seventh, who received B C G, has succumbed to a virulent infection. Although the medical staff of the hospital and dispensary never suggested that these deaths were caused by the vaccine, the lay press, on hearing of the Lübeck fatalities, has given ear to unauthorised rumours and has alarmed the Hungarian public by asserting that the five or six fatal cases at Ujpest were due to B C G. Dr. Dvorcsák states resolutely that this is not so, and that Calmette's vaccine has proved efficacious in very many cases under his control. He is going to report to the Royal Medical Society, but meanwhile the use of B C G. has been discontinued.

Compulsory Baths in Poland.

The Polish Chamber of Deputies will shortly consider a new Bill on obligatory bathing. The object of the Bill is to enforce bathing on people who have no bathrooms in their houses, and for the time being the law will only run in cities and towns where there are bathing establishments. It is proposed that the Government should put up bathing plants in the smaller towns and large villages, so that poor people will have access to bathing during the winter months. They will have nothing to pay for their bath excepting soap and towel, which they may bring themselves. The public health magistrates will employ controllers, to supervise the bathing booklets, each of which will contain 12 tickets to be used within three months. Exemption from bathing will be granted to people suffering from infectious or contagious diseases, skin troubles, tuberculosis, &c. It is not without interest that party politics has managed to raise objection even to such an obviously useful Bill. Certain opposition papers say that the soap trust has paid the Government to introduce it, and argue that it violates personal freedom since nobody should be forced to bathe when he has no mind to do so.

GLASGOW HOSPITAL FOR SICK CHILDREN.—In 1929 5359 patients were admitted to this hospital, which Dr. J. F. Fergus, President of the Royal Faculty of Physicians and Surgeons of Glasgow, described at the annual meeting as having gained "a European and almost a world-wide reputation." They came from every part of Scotland and were all under 13 years of age. Of the 20,000 children under 5 who annually join the Glasgow schools, 85 per cent. suffer from decayed teeth, 6 per cent. from rickets, 5 per cent. from enlarged tonsils, and 2 per cent. from discharging ears. The directors appeal for a research fund of £20,000 to investigate the causes and best means of preventing and curing the diseases of infancy and childhood. The corporation of Glasgow has granted the hospital exemption from parochial and education rates in virtue of the powers recently acquired from Parliament.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1929 statistics of two county boroughs, one borough, and five urban districts. All the reports refer to the exceptionally severe epidemic of influenza, which increased the mortality from respiratory diseases in varying degrees.

Name of district and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Sunderland C.B. .. (184,000)	22·3	17·0	1·54	1·36	4·6	2·1	109/33	105	6·1
Eastbourne C.B. .. (58,570	11·0	13·5	0·65	1·83	2·9	2·5	53/20	29	0·0
Edmonton U.D. .. (73,547)	17·6	10·8	1·17	1·20	2·0	2·4	62/—	23	3·8
Worcester C. and U.D. .. (52,320)	15·0	15·3	0·84	1·89	3·3	3·2	60/22	29	5·1
Pontypridd U.D. .. (45,320)	17·8	12·4	0·86	1·06	2·0	2·4	67/35	—	11·1
Bentley-with-Arksey U.D. (16,320)	18·5	10·2	0·86	0·55	2·6	1·2	119/—	—	9·9
Margate B. .. (29,580)	14·2	13·0	0·74	1·65	1·6	2·1	46/—	—	7·3
Ilfracombe U.D. .. (8,906)	14·0	14·6	1·01	1·34	2·6	4·6	56/—	—	0·0

Registered stillbirths per 100 live births:—Sunderland 4·1, Edmonton 3·6, Worcester 4·2, Pontypridd 8·0, Bentley-with-Arksey 3·6, Margate 3·2.

C.B. = County Borough. B. = Borough. U.D. = Urban District. C. = City.

Sunderland.

Dr. A. S. Hebblethwaite gives a photograph and plan of the 20-bedded pavilion which has been added to Grindon Sanatorium, and was opened by the Duke of York on Oct. 31st. This brings the accommodation for surgical tuberculosis in children up to 50. The new pavilion has six two-bed cubicles and two four-bed wards. The maternity and child welfare scheme has been extended by the institution of two new infant welfare centres in outlying districts and one new antenatal centre. There are now four antenatal clinics, including one at the maternity home, for mothers, who intend to be confined in that institution. The births numbered 4111, and 1463 women attended the antenatal clinics. The medical functions of the board of guardians are to be dealt with by the public assistance committee for a period of 12 months, after which the health committee will deal with these transferred medical services. During the transition period the medical officer of health will act as medical officer to the public assistance committee.

The housing problem remains unsolved, although much renovation work has been done. During the year 410 new houses were erected as compared with 725 in the previous year. Overcrowding notices cannot be followed up owing to the lack of alternative accommodation. The measles death-rate was the highest since 1909. The deaths numbered 151, of which 25, 69, 27, 15 and 10, occurred during the first to the fifth year of life respectively. Deaths of children under two years from diarrhœa and enteritis were also high, giving a rate of 21·2 per 1000 births as compared with 8·1 in England and Wales. As shown in the table, the death-rate from respiratory diseases with influenza was unusually high, and 424 deaths were ascribed to pneumonia, giving a death-rate from this cause alone of 2·3. Of the 424 pneumonia deaths, 108 were those of infants, 90 occurred in the second year of life, and 54 at the age-period 2 to 5. An attempt is being made to raise funds for the establishment of a central institution for the radium treatment of cancer, but up to the present the response to the appeal has been disappointing. Both hospitals, however, have agreed to increase their facilities for the earlier detection and earlier admission of cancer patients.

The water-carriage system has now been generally adopted and extended to the area added in April, 1928. There is only one swimming bath in the town, and better facilities are needed. The chief smoke offenders in the borough are laundries, breweries, public baths and washhouses, and small vertical boilers connected with locomotives or travelling cranes at the North dock; the latter are a nuisance to the seaside resort of Roker. The 14 houses in the Newcastle-road area, which are "all electric," with the exception of one coal fire in the living room, continue to be satisfactory to the tenants. A certain amount of difficulty is found in enforcing the orders made under recent Acts for informing the purchaser of the country of origin of produce. The chief difficulty appears to be the liability of fruit labels becoming displaced. There are now only 381 cows kept in the borough, and among these the veterinary inspector discovered two which were giving tuberculous milk. Of 106 samples of outside milk examined biologically, three were found to be tuberculous.

Eastbourne.

Dr. W. G. Willoughby reports that the birth-rate was the lowest on record, and that there were 151 more deaths than births. The council has continued its policy of allotting municipal houses only to persons with families. Since 1921 houses have been built at double the pre-war rate, and the population is better housed. Nevertheless there are still nearly 200 instances where the council could have good tenants and very considerably improve existing uncomfortable conditions. A feature of the year 1929 was the end of the hut-dwellings. The last was vacated in January and the site is now practically covered with permanent dwellings. The huts were a boon when adapted in May, 1919, but became a burden by 1926. There are now 795 municipal houses and 18 more in course of construction. The council have accepted a number of unsatisfactory tenants with children, and comparatively few have failed to repay this consideration.

The births in the borough numbered 643; of these, 221 took place in the municipal maternity home and 84 extern cases were attended by the midwife from the home. The antenatal clinic at the home was attended by 318 expectant mothers. General practitioners are invited to use this clinic for their patients, and did so in 110 instances. There were no maternal deaths attributed to childbirth in the borough, but one maternal death unconnected with maternity occurred in the home from acute nephritis and heart disease. The municipal home-help is paid a salary of 35*s.* per week, and attended 48 homes for household duties in maternity cases, and eight homes for the relief of expectant or nursing mothers or mothers with children ill.

Edmonton.

Dr. H. W. Harding doubts if his urban district gets its moneys' worth from an expenditure of £10,000 annually on the Enfield and Edmonton Joint Isolation Hospital. Scarlet fever is so mild nowadays, and when epidemics do occur there is a tendency to overcrowd the wards and cause return cases. The majority of the fatal cases of diphtheria are doomed before admission because they come in too late. During epidemics the hospital cannot accom-

modate carriers because there is no room, and the virulence of diphtheria and the presence of carriers, especially nasal carriers, appear to go hand-in-hand.

The council has an arrangement for maternity beds at the North Middlesex Hospital, and is responsible for fees at the rate of 6*s*. per day, which are collected from the patient before admission. The admission order is signed by Dr. Margaret Outram, who is in charge of the antenatal clinic, and sees each case before admission. The council patients admitted during 1929 numbered 19, of whom 9 paid for themselves and 10 were assisted by the council to the extent of £33 14*s*. The births numbered 1299, and 164 women made 833 attendances at the antenatal clinic. Two motor ambulances for non-infectious cases are run by the fire brigade, and carry a Novita resuscitating apparatus, which has been used successfully in cases of gas poisoning and drowning. The brigade also keep a bedside oxygen apparatus which can be obtained by local doctors at a cost of 5*s*. per cylinder. Dr. Harding records with pleasure that building operations in the district have lessened the facilities for the encampment of van-dwellers.

The new schools are a great improvement on the older ones. A new school is shortly to be erected and on the same site an open-air school, which will accommodate not only cases of malnutrition but also physically defective and partially blind children. In 1928 there was a plague of flying beetles which was thought to be due to migration caused by the exhaustion of the natural food of these insects, which are carnivorous in habit. The plague did not recur in 1929. The arrangement made with the guardians for the treatment of rickets and marasmus by ultra-violet rays at the North Middlesex Hospital at a cost of 1*s*. per exposure, has been continued. Sixteen cases are reported as cured, but 26 discontinued treatment against medical advice. Dr. Outram makes a special report on the cases treated at the centres with irradiated milk. Good results are claimed. The cases included 28 nursing mothers, 3 debilitated mothers, 9 expectant mothers and 29 "toddlers," and two sets of twins. The "Sun-ray"—Scheidt's Cold Process-Milk was used, and the Foodstuffs Irradiation Co., Ltd., helped by providing free sun-ray milk for necessitous cases. The Express Dairy Co. provided the milk at a cost of 3*d*. per half pint, and in no instance was more than half a pint given daily.

Worcester.

Dr. Mabyn Read in his thirty-ninth report says that better housing of the poorer citizens is still the most urgent of the problems in the city, and goes on to refer to the great changes by the removal of the worst of the slums during his 39 years' term of office. Overcrowding, he says, as a factor inimical to good health, is second only in importance to insufficient food. Of the 268 council houses erected during 1929, 80 have been allotted to overcrowded families, but there are still 107 overcrowded families on the register. The majority are in poor circumstances, and more houses at a rental not exceeding 7*s*. per week are needed. The city has many old houses and crowded courts, and the only new application under the Housing (Rural Workers) Act, 1926, could not be entertained because the alterations involved a sacrifice of light and air.

The new small-pox hospital on the site of the old City Hospital has been completed, and provides excellent accommodation for the city and the adjacent area of the county. The treatment of the city water-supply by chlorine has been a great success. The refuse-tips of the city have again proved a nuisance to adjacent houses. One has been closed in consequence, and the others are to be periodically sprayed, but Dr. Read points out that it is necessary to deposit the refuse in smaller layers and to keep the tips covered with a sufficient quantity of earth. The Cash captive bolt pistol is in general use for stunning cattle and calves before slaughter at the public slaughter-houses, and at the 22 registered and one licensed private slaughter-house, and the slaughtermen would not like to go back to their old methods. The meat regulations are well observed. Many of the local butchers do a large retail trade in the villages and hamlets in the county, and one firm has a fleet of motors fitted with hooks, glass shutters, and electric light, wherein to display their goods. Two retailers and a wholesaler were fined for selling sausages containing sulphur dioxide without declaring the presence of a preservative. In the last annual report (see THE LANCET, 1929, ii., 579) the difficulty experienced in discovering the offending cow of a herd of 21, which was giving tuberculous milk, was described. Ultimately, in August, 1929, a cow with udder tuberculosis from this herd was slaughtered at the knackers' yard.

An ancient city like Worcester is specially liable to rat-infestation, and the rat campaign is continued all the year round, and not only in rat week. The report to the Ministry of Agriculture shows that wire-cage traps are largely used. Examples are given of the capture of 24 and 18 live rats in single cages in one night. During "rat" week the first prize was won by a ratcatcher with a total of 48, and the second with 44. One ratcatcher held a post-mortem upon a doe-rat, and found she would shortly have had a litter of 16.

Pontypridd.

Dr. A. G. M. Severn describes his district as typica of the distressed coal-mining area of South Wales. There has been an increased supply of free milk through the maternity and child welfare scheme and the schools. For the 12 months ended March 31st, 1930, £945 was spent, as compared with £380 in the previous year on milk and foods supplied through the centres. There are 8940 children on the school registers, and 606, or 6·8 per cent., were granted milk and biscuits on the recommendation of the school medical officer. This again is an increase on the previous year. The scheme for discovering the cases of malnutrition among the scholars is described. All children are weighed before beginning school meals and again at intervals of three months. The scheme has been much facilitated by the school teachers' help. The low-lying part of the town was flooded in November and December, owing to the unprecedented rainfall. The total fall for the year was 59·41 inches, and of these 28·03 fell in November and December. Effectual relief measures were adopted. There is still a shortage of working-class houses, but the 40 municipal houses built during the year, and the additional 40 sanctioned will do much to alleviate overcrowding. Mr. C. L. Saies, formerly part-time, has been appointed full-time dental surgeon, thus improving the dental service of both welfare centres and schools. A new health centre is to be erected, which will provide accommodation for all the usual clinics, with ultra-violet light, ionisation, and increased facilities for orthopædic treatment. In referring to the unusually high maternal mortality, Dr. Severn mentions that facilities have been provided for hospital treatment, specialists' consultations, and for free supply of antiserum to medical practitioners desiring it. One of the nine childbirth deaths was assigned to sepsis and eight to "other causes." The Public Health and School Medical Services are well coördinated, and the pre-school children are effectively followed up from infancy up to school entrance.

Bentley-with-Arksey.

Dr. A. B. Dunne shows that the "all causes" death-rate of 10·2 becomes 12·0 when standardised. Measures have been taken to prevent the recurrence of flooding in the Bentley moor district. The council has erected about 800 houses since the war. They are of a good class, of brick, built usually in pairs, and not more than 12 to the acre. Each house has a good-sized garden. The dirty and verminous tenant, says Dr. Dunne, has not been so much to the front as in previous years. There are about 270

cows in the district, and amongst these one was found to be giving tuberculous milk, while six were slaughtered on account of pulmonary tuberculosis and three on account of tuberculous emaciation, One case of small-pox was notified. The rash appeared on April 19th; the patient was delivered of a child on April 22nd; no one suspected small-pox until April 28th. The woman bore no signs of vaccination. The baby was born apparently healthy, but subsequently developed the disease and died. Neighbours and young children had been freely in and out of the house, but no secondary cases occurred —an illustration, says Dr. Dunne, of the very slight infectivity of this type of small-pox.

Margate.

Dr. Rowan McCombe says the population at the height of the season exceeds 100,000. There are four midwives in practice, two being municipal. The latter are paid by salary, and earn the greater part of it in fees. Dr. McCombe considers the very small cost to the ratepayers is amply justified. Extensions of the water-supply and sewerage system are in progress, and the arrangements for the discharge of the sewage are so satisfactory that "no trace of sewage has been seen on the Margate foreshore for very many years." The erection of a total of 356 municipal houses has alleviated the housing problem, but there is still a demand for small houses that could be let at an inclusive rent of not more than 12*s.* per week. A considerable number of underground rooms are used for sleeping during the summer months. The rainfall was only 16·85 inches during 1929, whilst the hours of bright sunshine were 1942·4.

Ilfracombe.

Dr. D. C. Adam says the population during the height of the season is about 40,000. One of the events of the year was an outbreak of diphtheria, chiefly affecting the scholars in Standards 1 and 2 of Hermitage School. There was no reason to suspect milk. There were 50 cases in all, mostly in the month of March. There had been five cases of diphtheria in December, 1928, traceable to a carrier, and Dr. Adam thinks that he found another carrier to connect the December cases with the March outbreak. One case proved fatal—a boy of 7, who died of heart failure on the tenth day of the disease. Owing to the shortage of houses many poor families are paying exorbitant rentals for rooms in houses constructed for the use of one family. The public abattoir has been reconstructed and enlarged, and the new buildings were formally opened on August 29th by Sir Robert Gower (Chairman of the R.S.P.C.A.). A description of the new building is given. There are also three private slaughter-houses near the centre of the town, "and their presence in such situations is very undesirable." Of the 860 cattle slaughtered and inspected only 21 showed evidence of tuberculosis, and "this exceptionally low percentage" is thought to be due to the youth and quality of the cattle slaughtered, and the fact the animals, owing to the mild climate, are only housed for a very short period during the year. The rainfall for the year was about 45 inches, and the hours of bright sunshine 1748·3.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 31ST, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 327 (last week 304); scarlet fever, 1939; diphtheria, 1088; enteric fever, 73; pneumonia, 975; puerperal fever, 52; puerperal pyrexia, 99; cerebro-spinal fever, 11; acute poliomyelitis, 4; acute polio-encephalitis, 1; encephalitis lethargica, 15; continued fever, 1; dysentery, 5; ophthalmia neonatorum, 97. No case of cholera, plague or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 3rd–4th was as follows:—Small-pox, 449 under treatment, 15 under observation (last week 462 and 13 respectively); scarlet fever, 2016; diphtheria, 2266; enteric fever, 25; measles, 712; whooping-cough, 77; puerperal fever, 26 (plus 17 babies); encephalitis lethargica, 121; poliomyelitis, 1; "other diseases," 18. At St. Margaret's Hospital there were 14 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 48 (14) from measles, 5 (2) from scarlet fever, 24 (5) from whooping-cough, 32 (8) from diphtheria, 37 (9) from diarrhœa and enteritis under two years, and 29 (4) from influenza. The figures in parentheses are those for London itself.

The fatal case of enteric fever outside London occurred at Sunderland. Five deaths from measles were reported from Warrington; not more than 2 from any other great town. Liverpool reported 6 deaths from diphtheria and 5 from diarrhœa.

The number of stillbirths notified during the week was 307 (corresponding to a rate of 43 per 1000 births), including 68 in London.

Correspondence.

"Audi alteram partem."

BLOOD CULTURE IN DIAGNOSIS OF ENTERIC INFECTION.

To the Editor of THE LANCET.

SIR,—To Dr. Eustace Thorp's further remarks (in your last issue, p. 1235) on enteric and the Widal test I should like to add some remarks of my own. The Widal agglutination test is an estimation of antibody formation on the part of the patient, either in response to actual infection by *B. typhosus* or *paratyphosus*, or as the result of prophylactic inoculation with a vaccine of these organisms. In the early stages of enteric infection there is probably present in all cases a bacillæmia, which is accompanied by a leucopenia—indicating an inhibition of the hæmopoietic centres as a result of this blood infection.

(1) In one group of cases this bacillæmia, either on account of a mild type of infection, or a good resistance on the part of the patient, may be transitory, and in such a satisfactory antibody response and a positive Widal reaction develop comparatively early.

(2) In a second group the infection may be more intense, or the patient's ability to respond less satisfactory with the result that antibody formation is delayed and the Widal reaction only obtained from the blood serum later than the normal time.

(3) In a third group of cases, either on account of the intensity of the infection or the total lack of an immunising response on the part of the patient, and in spite of definite clinical evidence of a typical typhoidal infection, a fatal issue may result without the appearance in the blood serum of a positive Widal reaction.

Frequently in such cases a blood-count estimation showing the presence of a leucopenia and a deficiency in the polymorph response may be as definite a sign of typhoidal infection as the Widal reaction. But in all three groups of cases the earliest and most helpful test is a blood culture taken into sterile bile. Three to five c.cm. of blood (with sterile precautions) are introduced in 10 c.cm. of bile, and the recovery of the infecting organism, whether typhoid or paratyphoid, is usually obtainable within 24 hours.

In three recent cases of pyrexia of four to five days' duration, in which a typhoidal infection was suspected but where there was little clinical evidence to support the diagnosis, the bile blood culture in each case gave such a positive result. In one case for typhoid, and in the other two for paratyphoid B, and in each case a Widal was not positive from seven to ten days subsequent to the definite diagnosis having been made by this means.

The technique is in no way difficult, and the bile easily sterilised and kept on hand for such emergency use, and this

is a method one feels should be used more promptly and in all suspicious cases of typhoidal infection. Ordinary broth cultures, although occasionally successful, are not nearly as reliable as the simple bile blood culture above referred to, probably because a certain degree of agglutination of the organisms present in the cultures takes place during incubation of the blood, and prevents satisfactory growth, while in the bile culture through a physical alteration of surface tension, agglutination is prevented and growth of the infecting organism if present is encouraged.

(4) A fourth group of cases are those in which relapse occurs after the development of a definite Widal reaction through some intercurrent depression of the patient's resistance, or the development of an ecyphylactic focus, reinfection of the blood stream takes place accompanied by marked reduction or disappearance of the Widal reaction, which may later again develop. During this period of relapse the blood culture may again be found positive, and the condition thus proved to be a real typhoid relapse and not due to a secondary septic infection.

The Widal reaction must obviously depend not only upon the virulence of the infecting organism, but perhaps even more upon the ability of the patient to produce a satisfactory immunity response, and this will account for the variable findings which have been recorded, and which do not justify the conclusion that the Widal test as such is unreliable, but that the patient's immunity responses to a definite infection cannot be guaranteed, for without the development of protective agglutinins in the patient's serum the test cannot give a positive result. A marked positive Widal after 10 to 14 days' pyrexia indicates a satisfactory prognosis as far as the typhoid infection is concerned, although it gives no guarantee that secondary infection may not develop, or an intestinal perforation or hæmorrhage occur. A mild and delayed Widal reaction in a severe case of infection probably gives evidence of a less satisfactory prognosis from a typhoidal point of view.—I am, Sir, yours faithfully,

E. CRONIN LOWE, M.B.E.

Liverpool, June 6th, 1930.

THE MECHANISM OF PULMONARY COLLAPSE.

To the Editor of THE LANCET.

SIR,—Dr. Watson-Williams's quotation from "All Quiet on the Western Front" has an interesting bearing upon the nature of pulmonary collapse. Experience in surgery of the chest indicates three facts:—

1. When one side of the chest is *opened freely*, as for the removal of an osteo-chondroma of the ribs, the lung collapses momentarily but is blown out forcibly to the chest wall with every expiration, the later expansions being more distinct than the first.

2. When *discission* of a thickened pleura is done for chronic collapse of the lung, provided that the incisions are numerous, cross-cut, and deep enough to reach the reddened surface of the lung proper, the cuts open up as spaces, followed by expansion of the lung in proportion to the thoroughness of discission.

3. When *decortication* is performed (a more serious and sanguinary operation) the decorticated lung comes up to the surface like a piece of soft red sponge.

The inherent tendency is for the exposed lung to expand or be blown out to the chest wall.

I am, Sir, yours faithfully,

THOMAS CARWARDINE.

Clifton, Bristol, June 6th, 1930.

FATAL AND MEDICINAL DOSES.

To the Editor of THE LANCET.

SIR,—In an annotation last week (p. 1246) entitled The Object of a Pharmacopœia you note a very unsatisfactory position in regard to drugs producing general anæsthesia—namely, that the effective anæsthetic doses of the drugs in use are more than 50 per cent. of the fatal doses, "a smaller margin of safety than with any other class of important drugs." In the case, however, of at least one anthelmintic this unenviable record is completely broken. For carbon tetrachloride whose structure and pathological effects are similar to those of chloroform, the fatal dose is 1·5 c.cm.; while the dose advised as effective and used in tens of thousands of hookworm infections is 3 c.cm., or twice the fatal dose. This advised dose has naturally killed a varying proportion of those who have taken it. Further, it has been freely administered without troubling to discover whether any particular recipient was infected, in which case it remains unknown whether individuals so sacrificed should have been treated at all. We were next confronted with the statement that such herd treatment, which used double the minimum lethal dose and which had killed, had justified itself because with a minimum of trouble it had much reduced the worm load of a community. Those who receive herd treatment are certainly among the lowly, yet no advocate of such treatment has contended that they should be held no higher than cattle. Surely they should receive no treatment without previous diagnosis, and unless it is based on that humane principle of close attention to the fatal dose which your annotation, justifiably but wrongly, assumes to be always and everywhere accepted by medical men.—I am, Sir, yours faithfully,

Ealing, W., June 7th, 1930. CLAYTON LANE.

AREA OF PRIMARY INVOLVEMENT IN PULMONARY TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—With reference to Dr. Hanan's letter in your last issue, there appears to be no doubt that several different opinions have been expressed as to which portion of the lungs is first affected in pulmonary tuberculosis. In my experience, there appears to be a difference in the two sexes, definite signs appearing first more frequently on the right side in males and on the left in females. Some years ago I took out figures in respect of 1232 sputum-positive cases, and after eliminating 152 instances in which it was impossible to decide which lung was more extensively affected, I found that 59 per cent. of males showed more advanced disease on the right side when first examined and 61 per cent. of females on the left side. These figures refer to the days before X ray facilities were available locally, and I am proposing to take out further figures relating to X ray films only. I am convinced that there is a definite difference according to sex. I am, Sir, yours faithfully,

W. H. DICKINSON.

Newcastle-upon-Tyne, June 7th, 1930.

DISCOVERY OF BLOOD GROUPS.

To the Editor of THE LANCET.

SIR,—In your issue of May 3rd (p. 977) S. C. Dyke reviews the history of the discovery of the blood groups in a way which inadvertently does such injustice to the discoverer of the groups that I am sure Dr. Dyke will himself welcome a correction of the mistake.

Dr. Dyke states that "the first steps towards the identification of the blood groups were made by Landsteiner," and further, that "the existence of certain differences in the blood of human beings, differences which enabled them to be classed into four groups, was discovered and reported independently in Europe by J. Jansky and in America by W. L. Moss." The facts are that Landsteiner, in 1900, reported[1] his discovery of the three more common groups, at the same time correctly recognising the underlying serologic constitution of the different bloods and pointing out the significance of his findings

[1] Landsteiner, K.: Wien. klin. Woch., 1900, xiv., 1132.

with respect to blood transfusion. Shortly thereafter, Decastello and Sturli,[2] the latter a co-worker of Landsteiner, with Landsteiner's permission, continued the study and they reported, in 1902, the existence of the fourth group. Landsteiner's review in Oppenheimer's Handbuch (1908–09) briefly describes the four groups. Jansky's study, reported in 1907, was undertaken merely with the purpose of seeing whether there was any special relationship between the blood groups and neuropathology; no such relationship was found, and Jansky simply numbered the groups in the order of their frequency, contributing nothing further to the general knowledge of the blood groups. Moss, in 1909–10 reached the mistaken conclusion that the blood groups depended upon three pairs of iso-agglutination elements.[3] He numbered the groups without reference to frequency, and pointed out the difference between his numbering and that of Jansky. He referred to Landsteiner's original paper but omitted mention of the report by Decastello and Sturli and of Landsteiner's review. Von Dungern and Hirschfeld, in 1910, confirmed Landsteiner's logical conclusion regarding the serologic constitution of the different bloods and made the important discovery of the inheritance of the agglutinable substances A and B. Upon Landsteiner's suggestion, made through the Committee on Blood Groups of the National Research Council, the designation of the groups by letters has been adopted by important societies in this country and by the United States army and navy.

I am, Sir, yours faithfully,

ARTHUR F. COCA, M.D.,
Formerly Chairman of the Committee on Blood Groups of the National Research Council.

June 7th, 1930.

THE POSITION OF THE MEMBERS OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

To the Editor of THE LANCET.

SIR,—During the next two weeks the Society of Members of the Royal College of Surgeons of England will circularise all Members resident in the United Kingdom and Ireland soliciting a postal vote on the question of some representation of the Members on the Council of their College. Having regard to the great amount of work and expense entailed thereby, it is earnestly hoped that all Members will respond promptly and thus make their views known.

I am, Sir, yours faithfully,

ERNEST E. WARE, President.

60, Welbeck-street, W., June 10th, 1930.

[2] Decastello, A. V., and Sturli, A.: Münch. med. Woch., 1902, p. 1090.

[3] Moss, W. L.: Trans. Assoc. Amer. Phys., 1909, xxiv., 419; and Bull. Johns Hopkins Hosp., 1910, xx., 63.

VICTORIA PARK HOSPITAL.—Last year the City of London Hospital for Diseases of the Heart and Lungs treated 11,982 patients at a cost of £37,714. Of these 1094 were in-patients who stayed on an average 53 days, and their weekly average cost was £3 9*s.* 4·59*d.*, an increase of 5*s.* 6*d.*

EPPING FOREST HOSPITAL.—The Marquis of Carisbrooke recently opened extensions to this hospital which have cost £9000. The enlargements include a ward as a memorial to the late Lord Lambourne, provided by the Freemasons of West Essex, who raised £2000 for the purpose.

SHEFFIELD AMBULANCE SERVICE.—Last year the Sheffield ambulances carried 31,000 patients and travelled 134,000 miles. It is complained that the number of ambulances is insufficient; at present there are six. In future persons of opposite sexes are not to be carried in the same ambulance.

Obituary.

JOHN BUCKLEY BRADBURY, M.D., F.R.C.P.,

DOWNING PROFESSOR OF MEDICINE, CAMBRIDGE.

THE death took place at Cambridge on Wednesday, June 4th, of the veteran Downing professor of medicine who was personally known to three generations of Cambridge medical students.

John Buckley Bradbury was a Yorkshireman, who received his education at King's College, London, whence he entered Gonville and Caius College, Cambridge. But while an undergraduate there he migrated to Downing where he obtained a science scholarship, and was eventually placed in the first class in the Natural Science Tripos in 1864. He completed his medical curriculum, and spent the whole of his academic and professional life in Cambridge. Over 60 years ago he was elected physician to Addenbrooke's Hospital, and for more than 30 years he superintended the medical training of students at Downing, while at Caius he was a lecturer on subjects ancillary to medicine. He was appointed Downing professor of medicine in 1894 on the resignation of the late Dr. P. W. Latham, and was by far the oldest man in the University of Cambridge to hold professorial rank. He was also the senior Fellow of the Royal College of Physicians of London where he became a Fellow in 1874, and served on the Council; he delivered the Bradshaw lecture in 1895 on the pharmacology of the vasodilators, and the Croonian lectures in 1899 on hypnotics. These lectures were the foundation of a volume, published shortly afterwards, on the treatment of sleep and sleeplessness, a subject which he made particularly his own. He acted as an examiner in medicine both at Oxford and Cambridge, and at his own University as an examiner in the Natural Science Tripos. He was one of the best known inhabitants of the city, and was devoted to the interests of Addenbrooke's Hospital to which institution he was physician for 50 years—viz., from 1869 to 1919, when he became consultant. He gave for many years clinical demonstrations in the hospital, while he lectured in his official capacity mainly on therapeutics.

Prof. Bradbury was twice married, first to Sarah, daughter of Mr. James Openshaw, and secondly to Jane, daughter of the Rev. R. Gwatkin.

HARRY COOPER PATTIN, M.D.CAMB., D.P.H.,

LATE MEDICAL OFFICER OF HEALTH, NORWICH.

WE regret to record the death of Dr. Cooper Pattin, lately medical officer of health for the city of Norwich and an ex-president of the Society of Medical Officers of Health, which occurred at Torquay on May 30th.

Harry Cooper Pattin received his medical education at Jesus College, Cambridge, and St. Thomas's Hospital, and graduated in medicine at Cambridge in 1890, having taking the double diplomas of the English Conjoint Board a year previously. His whole professional life was spent in Norwich, and for 33 years he had charge of the public health of the city, where his scientific qualifications and his great social gifts were equally recognised. Norwich is a city mediæval in history and in much of its architecture, and modern in its developments and amenities, so that a man who could hold a public position for so long a period, while secure in the approval and support of official authority and popular esteem, may be said to have proved himself a practical success. Cooper Pattin was a great medical officer of health. The structural transformations in the old yards and courts, and the institution of special hospitals, which were brought about by the town council of Norwich and its health committee by Cooper Pattin's organisation, were reflected in remarkable improvements in the health of the city, but they could not come into being without much interference with vested interests,

and it required a man of his energy and integrity to make the reforms acceptable. When he retired from office four years ago he was able to quote figures showing remarkable improvements in death-rate and mortality and to hand on a successful health department which had practically been created by himself.

In private life Cooper Pattin was a man of high culture, a good judge of music and painting, a versatile and sometimes brilliant writer, a witty public speaker, and throughout his life a great traveller.

JOSEPH BIRT, M.R.C.S. Eng., L.R.C.P. Edin.,

ANÆSTHETIST TO THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET, LONDON.

On May 20th last Dr. Birt, the well-known anæsthetist died, at the age of 67, and his death has been the occasion of our receiving an extraordinary testimonial to his character and worth from his intimate fellow workers.

Joseph Birt was educated at Brighton College, intending to become an engineer, but he entered the medical profession at the wish of his mother and joined the medical school at St. George's Hospital, whence he qualified as M.R.C.S. Eng. in 1886. He later acquired the L.R.C.P. Edin. in 1887 and for a time worked at the Sussex County Hospital. He then established himself in general practice at Uckfield, where he quickly earned the confidence and esteem of a large range of patients, rich and poor alike. He himself attributed to the late Mr. Pickering Pick, who had perceived his professional qualities and ability, the encouragement necessary to enter medical practice in London, and ten years later he established himself in the neighbourhood of St. George's Hospital, became medical officer to the Royal Pimlico Dispensary, and soon gathered round him an extensive practice to whom his personality made a particular appeal.

We owe to Mr. Tyrrell Gray, one of Birt's colleagues at Great Ormond-street, the following account of how this successful general practitioner, already in middle age, developed into a fine exponent of a difficult specialty. "In his search for some field of usefulness to his country during the war," says Mr. Gray, "Joseph Birt, with rare insight, decided that, at his age, anæsthetics offered him the best opportunity to help. His genius in this specialty was so quickly recognised that he was not only appointed anæsthetist to seven hospitals, but was unofficially coöpted to numerous hospitals to deputise for absentees in emergency. As a result his services were everywhere available both day and night, for refusal never occurred to him, and there is no doubt that his unfailing and willing response to every request for his services (both during the war and subsequently) was responsible for the long and intermittent illness which ultimately led to his death. But it was at Great Ormond-street that everyone realised his extraordinary flair for anæsthetising children and babies. There his colleagues quickly appreciated that study, knowledge, and experience could not alone be responsible for that outstanding command of a child's confidence which he invariably displayed. His gentle and affectionate disposition, together with the innate love of and compassion for anything young (especially in suffering)—these were the qualities which inspired the trust and affection of all children with whom he came in contact; and these were essentially the qualities which won him his special niche at Great Ormond-street. In the profession he will be remembered for his pioneer work in anæsthetising children—particularly for the standardisation of gas and oxygen anæsthesia as the method of choice for Rammstedt's operation. Living with his sister in a contented simplicity, he will be remembered by his colleagues as the embodiment of the dignified courtesy of a past age; for his love of everything young and beautiful; for a sense of humour which never hurt any feelings; and for his devotion to Great Ormond-street Hospital, where he could usually be found on Sunday morning playing with the children. In his daily life he impoverished himself by his indiscriminate generosity though this never occasioned him any regrets—indeed, he was not conscious of it. One or other of these characteristics is reflected in all of the numerous letters written by patients and friends. To quote from three of them: In one: 'Such a personality can never die'; in another: 'He must be somewhere on ahead, waving an encouraging hand'; or again: 'I think he knew more of all our troubles than anyone.'"

We have received from the surgical staff and the senior anæsthetist at the Children's Hospital individual letters setting out the reasons for the esteem with which they regarded Joseph Birt, to whom they one and all attribute the personality which is brought before us by Mr. Tyrrell Gray. The affection which this good man inspired among all he came in contact with was truly remarkable.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Whitsuntide Adjournment.

On Wednesday, June 4th, the House of Lords adjourned for the Whitsuntide recess until Tuesday, June 17th. The House of Commons adjourned on Friday, June 6th, until the same date.

HOUSE OF COMMONS.

Wednesday, June 4th.

Tuberculosis (Calmette Treatment).

Mr. Freeman asked the Minister of Health whether the Calmette prophylactic treatment in regard to tuberculosis which had been followed by the death of 16 infants in Lübeck, Germany, was being advocated or employed in this country with the permission or under the instructions of the Ministry of Health.—Mr. Greenwood replied: The answer is in the negative. I may, however, add that the Medical Research Council has been engaged since 1925 in investigating the statistical and bacteriological evidence relating to this treatment and I am kept informed of their researches. I am informed that two representatives of the Medical Research Council have gone to Germany to obtain further information concerning the deaths at Lübeck.

Psychotherapeutic Treatment.

Mr. Mander asked the Minister of Health the number of beds available in this country for cases receiving psychotherapeutic treatment.—Mr. Greenwood replied: Psychotherapeutic treatment is available in the normal course at many institutions under the jurisdiction of the Board of Control for such patients as are likely in the opinion of the medical staff to benefit from it. But beds are not specially set aside for such cases in these institutions.

Insanitary Conditions in London Boroughs.

Mr. Gould asked the Home Secretary whether he had now received any report respecting his investigations in certain London boroughs arising out of the report prepared by Mr. A. D. Denning; and what steps he proposed to take regarding it.—Mr. Clynes replied: I have now received a report which covers 57 factories and workshops, including all classes and sizes of works, and gives detailed particulars as to the actual conditions. Its general effect is to confirm the opinion previously expressed that Mr. Denning's report gives a very exaggerated account. While poor or bad conditions were found in some half-dozen cases, about one-half of the whole number are definitely reported as good, and the remainder reached on the whole a satisfactory standard. Action has already been or is being taken to bring the conditions in every case into conformity with the Act, and I propose to call for a further report in due course as to the results of this action. I also propose to communicate a copy of the report to the joint committee of the industry for whom Mr. Denning's report was prepared, and shall be glad to consider any observations they may wish to make.

Extensions to East Ham Isolation Hospital.

Sir Assheton Pownall asked the Minister of Health whether he had recently sanctioned a loan to the East Ham town council for extensions to the local isolation hospital;

and, if so, what was the amount sanctioned.—Mr. GREENWOOD replied: I sanctioned on May 19th loans amounting to £40,663 to the East Ham town council for extensions to their isolation hospital.

Grading of Milk.

Dr. VERNON DAVIES asked the Minister of Health if his attention had been drawn to the recommendation of the Council of Agriculture for England that the grades of new milk recognised under the Milk (Special Designations) Order, 1923, should be altered—viz., that Certified should be altered to extra special, Grade A (T.T.) to special, and Grade A to standard; and, seeing that the standard milk for this country would thus be the lowest grade milk, that it was not produced from tuberculin tested cows, and that the new designations were not self-explanatory to the consumer, what action, if any, he proposed to take with regard to this recommendation.—Mr. GREENWOOD replied: I have received a copy of the report embodying the recommendation to which the hon. Member refers. I will consider the recommendation as well as the hon. Member's criticism, but I cannot contemplate the introduction of legislation on this subject in the immediate future.

Ultra-violet Ray Treatment.

Viscount ELMLEY asked the Minister of Health whether there was any provision made for the treatment of National Health Insurance patients by means of ultra-violet rays; and, if so, by whom the cost was borne.—Mr. GREENWOOD replied: Any question whether in a particular case this form of treatment is within the scope of medical benefit has to be decided in accordance with Article 43 of the Medical Benefit Regulations, and the method of payment depends upon the decision so arrived at.

Smoke Abatement By-laws in London.

Mr. D. G. SOMERVILLE asked the Minister of Health which authorities in the London area had made by-laws under the Smoke Abatement Act, 1926.—Mr. GREENWOOD replied: Seventeen local authorities in the Greater London area have made by-laws under this Act. The following are their names: Town Councils of Acton, Croydon, Kingston-upon-Thames, Leyton, and Richmond (Surrey); Urban District Councils of Brentford and Chiswick, Finchley, Hampton, Hayes, Heston and Isleworth, The Maldens and Coombe, Mitcham, Surbiton, Wembley, and Willesden; Rural District Councils of Epsom and Hendon.

Certification of a Mental Patient.

Mr. GOULD asked the Minister of Health if he was aware that a lady, M. H., was placed in Camberwell House on the petition of her husband in December, 1903; that this lady was discharged in August, 1929, but was debarred from taking legal action against the doctors who certified her, owing to the Statute of Limitations, which required such action to be taken within six years of certification; and whether he would introduce legislation to prevent persons in such cases being deprived of redress on such grounds.—Mr. GREENWOOD replied: I cannot properly comment upon an individual case, but I understand that the effect of a decision in the House of Lords is as stated by my hon. friend. I cannot, however, undertake at present to introduce legislation on the point.

Exchequer Grants to Voluntary Societies.

Mr. DAY asked the Minister of Health the total amount of Exchequer grants of all kinds paid to voluntary societies in England and Wales to maternity and child welfare, welfare of the blind, and tuberculosis for the 12 months ended to the last convenient date.—Mr. GREENWOOD replied: The grants paid to voluntary societies in England and Wales in respect of the services mentioned during the year ended March 31st, 1930, were as follows: Maternity and child welfare (including grants for the training of midwives and health visitors), £264,354; welfare of the blind, £124,007; treatment of tuberculosis (paid to the Welsh National Memorial Association), £112,196.

Factory Inspectors and Cancer Research.

Mr. PHILIP OLIVER asked the Home Secretary whether, and to what extent, the medical inspectorate of the factory department had been able to assist in the investigation at present being carried out by the London Cancer Hospital into the incidence of the disease of cancer of the bladder among workers in aniline factories; and whether and to what extent the Registrar-General had been able to supply the statistical information required for the investigation.—Mr. CLYNES replied: The precise manner in which the Factory Department could best assist in this investigation has been explored, and it was decided that they should coöperate more particularly in tracing, so far as is necessary and practicable, the exact occupations of persons who have died of cancer of the bladder. For this purpose the Registrar-General is extracting information from his records, and the first Return is, I understand, practically ready. As I have warned the hon. Member, the research is a complex and difficult one, and I am afraid it is impossible to forecast when we may expect any conclusive results.

Diagnosis of Silicosis.

Mr. HOPKIN asked the Home Secretary if he was aware that the late Thomas Davies, of Gorslas, Carmarthenshire, was certified in June, 1929, by his family doctor to be suffering from silicosis and was a few weeks later declared by the medical referee not to be suffering from silicosis; that in April, 1930, the post-mortem examination showed that he died from silicosis; and that at the inquest the verdict was returned in accordance with the medical evidence—viz., that Thomas Davies died from silicosis; and if he was now prepared to change Order 975 so as to obviate the effects of such mistakes to the miner or his dependants.—Mr. CLYNES replied: I have received reports on this case, and the facts appear to be as stated in the question. I am advised that, owing to the presence of the condition known as anthracosis, the diagnosis of the disease in this case would, during the workman's lifetime, be one of peculiar difficulty, and the case affords a very good illustration of the need for improved medical arrangements by the setting up of an expert Medical Board for the whole country as recommended by the Departmental Committee. I am seeking to obtain the necessary powers for this purpose in the Workmen's Compensation (Silicosis) Bill which is now before this House, and which I hope will be proceeded with immediately after the Recess, and I can assure my hon. friend that as soon as the Bill becomes law steps will be taken to establish the new medical organisation with the least possible delay.

Experiments on Living Animals.

Mr. FREEMAN asked the Home Secretary whether he was aware that experiments upon living animals had been conducted at the physiological laboratory, Cambridge, by Mr. B. H. C. Matthews, the purpose of which was to measure pain; what species of animals were used in this investigation; and under what certificates were the experiments conducted.—Mr. CLYNES replied: I have made inquiry into the circumstances. The purpose of the experiments was not to measure pain, but to measure electrical impulses, and they were not performed on living animals. No licence is necessary for this, and Mr. Matthews does not hold one.

FRIDAY, JUNE 6TH.

Pensions and Conditions of R.A.M.C. Officers.

Lieut.-Colonel FREMANTLE asked the Secretary of State for War (1) if he was aware that whereas combatant officers' pensions had increased in value since the war, the pensions of officers of the R.A.M.C. had decreased; that the pension earned by a major, R.A.M.C., at 20 years was now £368 per annum, which, having regard to the increases in income-tax and the cost of living was worth little more than half the pre-war rate of £365 per annum, fixed in the reorganisation of the Army Medical Service in 1902; and if it was proposed to reduce or increase this pension this year; (2) if he could give any undertaking that the maximum pension for a lieutenant-colonel of the R.A.M.C., attainable after 28 years' service, would not be further reduced from its present amount of £558; and (3) if he was aware that the officer strength of the R.A.M.C. was inadequate for requirements, resulting in the employment of civilian practitioners, and the re-employment of retired officers, all of whom did home service only, and that the average period of foreign service undertaken by regular officers, R.A.M.C., had increased in consequence; and whether, seeing that this prospect was bound adversely to affect the recruitment of young medical officers to the service, he would consider how these conditions of service could be improved.—Mr. T. SHAW replied: I have under my personal consideration at the present time the whole question of the supply of officers for the R.A.M.C. As regards the detailed information for which the hon. and gallant Member asks, last year special steps were taken to render conditions of service in the Corps more attractive. Certain concessions have been made regarding the counting, for purposes of promotion, increase of pay and pension, by officers appointed to permanent commissions in the Corps, of temporary service in the Corps, or of time spent in a civil hospital appointment. The Army Council are also in touch with civil hospitals at the present time to see whether arrangements can be made by which R.A.M.C. officers may be enabled to secure experience in civil hospital appointments. As regards retired pay, the retired pay of majors and lieutenant-colonels of the R.A.M.C. in receipt of post-war scales is subject, like that of other officers, to revision next year in the light of the cost of living figure. I cannot anticipate what the result of that revision will be.

Vaccination of Small-Pox Contacts.

Mr. GROVES asked the Minister of Health whether he was aware that pyæmia, referred to in the death certificate of the infant which recently died from small-pox and pyæmia at the Joyce Green Hospital within five days after being vaccinated, was attributable to the operation of vaccination; and whether, in view of the fact that in this case and other similar cases there was strong ground for believing that vaccination after small-pox had commenced to incubate merely added to the patient's troubles, he would direct his medical officials to discourage as far as possible the vaccination of small-pox contacts.—Mr. GREENWOOD replied: If, as I assume, my hon. friend is referring to the case of Frank George Young, I am informed that death took place 25 days, and not 5 days, after the infant was vaccinated. I have caused inquiries to be made into the case, and am advised that the pyæmia referred to in the death certificate supervened on the small-pox, and that the death is not in any way attributable to the vaccination. As regards the second part of the question, I would refer my hon. friend to the answer [1] given to him on this subject on April 3rd.

Medical News.

UNIVERSITY OF LONDON.—At recent examinations the following candidates were successful:—

THIRD EXAMINATION FOR M.B., B.S.

With Honours.—P. B. Ascroft (*d*), Middlesex Hosp.; Margaret E. Cook (*b*), L.S.M.W.; K. M. Robertson (*a*), St. Thomas's Hosp.; and Ursula Shelley (*c*, *d*) *University Medal*, L.S.M.W. (*a*) Distinguished in Medicine. (*b*) Distinguished in Pathology. (*c*) Distinguished in Forensic Medicine. (*d*) Distinguished in Surgery.

Pass.—E. F. D. Baker, D. A. Beattie, and A. C. H. Bell, St. Bart.'s Hosp.; J. R. Buchanan and C. W. F. Burnett, Univ. Coll. Hosp.; E. A. Butterworth, St. Mary's Hosp.; Charlotte A. G. Conway, L.S.M.W.; E. T. Conybeare, Guy's Hosp.; W. W. Craner, London Hosp.; H. B. A. R. Densham, Guy's Hosp.; D. C. L. Derry, St. Thomas's Hosp.; P. C. C. de Silva, King's Coll. Hosp.; F. B. P. Evans, Univ. of Birmingham; Rees Evans, Univ. Coll. Hosp.; S. N. Evans, Guy's Hosp.; R. H. Franklin, St. Thomas's Hosp.; Ruth C. Galletly, L.S.M.W.; E. M. Goitein, Univ. Coll. Hosp.; C. S. Gross, Guy's Hosp.; Ernest Grundy, Univ. of Leeds; A. G. Harsant, London Hosp.; J. C. Hatrick, Univ. Coll. Hosp.; J. C. Heather, Guy's Hosp.; H. B. Hodson, St. Thomas's Hosp.; A. S. Hoseason, St. George's Hosp.; C. B. Huss, St. Bart.'s Hosp.; Phyllis Hutchinson, King's Coll. Hosp.; John Ives, St. Mary's Hosp.; A. N. Jones, Guy's Hosp.; O. V. Lloyd-Davies, Middlesex Hosp.; Laura H. Macfarlane, L.S.M.W.; H. G. McGregor and B. R. Medlycott, Guy's Hosp.; T. W. Morgan, St. Thomas's Hosp.; C. L. Oakley, Univ. Coll. Hosp.; C. M. Ockwell, Guy's Hosp.; Ralph Oliver, Univ. Coll. Hosp.; R. A. H. Pearce, Middlesex Hosp.; G. F. Peters, Guy's Hosp.; R. K. Price, St. Bart.'s Hosp.; Ruth Pumphrey, Univ. Coll. Hosp.; Barkat Ram, St. Thomas's Hosp.; Henry Richards, Guy's Hosp.; Margaret P. Roseveare, L.S.M.W.; T. N. Rudd, London Hosp.; J. C. Saldanha and R. M. Sargent, Univ. Coll. Hosp.; J. G. Scadding, Middlesex Hosp.; J. M. Scott, St. Bart.'s Hosp.; M. D. Sheppard, Univ. Coll. Hosp.; L. A. H. Snowball, King's Coll. Hosp.; T. T. Stamm, Guy's Hosp.; Brian Stanley, Univ. Coll. Hosp.; Sybil M. A. Stanley, L.S.M.W.; W. D. Steel, Univ. of Birmingham; J. H. Watkin, St. Bart.'s Hosp.; Margaret M. White, L.S.M.W.; G. P. B. Whitwell, Guy's Hosp.; Joyce M. Wigram, L.S.M.W.; R. N. Wilcox, St. Thomas's Hosp.; E. G. Wilkins, Middlesex Hosp.; and Margaret D. Wright, Univ. Coll. Hosp.

The following candidates passed in the undermentioned parts of the examination:—

Group I.—Frederick Back, St. Thomas's Hosp. and London Hosp.; E. F. Barnardo, London Hosp.; F. G. L. Barnes, St. Bart.'s Hosp.; A. C. Byles, St. Mary's Hosp.; W. H. P. Cant, Univ. of Birmingham; Rosa E. Chamings, L.S.M.W.; E. E. Claxton, St. Bart.'s Hosp.; H. J. Croot, Guy's Hosp.; C. E. Dolman, St. Mary's Hosp.; Beryl M. Furlong, Mabel E. Grace, and Honor E. C. Harvey, L.S.M.W.; H. B. Jackson, Middlesex Hosp.; Victoria H. King, L.S.M.W.; H. J. Knight, St. Mary's Hosp.; Nellie I. Lanckenau, Univ. Coll. Hosp.; I. W. Lazarus, London Hosp.; Annie M. McGrath, Westminster Hosp.; Joyce MacInnes, L.S.M.W.; Eileen M. Massey, King's Coll. Hosp.; Elizabeth T. Mess and Ruth Milne, L.S.M.W.; R. S. Risk, St. Bart.'s Hosp.; J. B. Robinson, Guy's Hosp.; Douglas Stanley Jones, St. Bart.'s Hosp.; H. H. Steadman, Guy's Hosp.; Muriel H. Steven, King's Coll. Hosp.; Olive C. Watkin, Charing Cross Hosp.; and T. H. Wilson, St. Thomas's Hosp.

Group II.—W. L. M. Bigby, Guy's Hosp.; Anthony Caplan, St. Bart.'s Hosp.; A. G. Carmichael, Middlesex Hosp.; J. B. George, St. Thomas's Hosp.; Bryneilen Griffiths, Univ. Coll., Cardiff, and Charing Cross Hosp.; Eric Gwynne-Evans, Univ. Coll. Hosp.; Mary W. Hamlyn, L.S.M.W.; P. Y. Hicks, St. Thomas's Hosp.; R. E. Holmes, London Hosp.; S. W. Holmes, St. Mary's Hosp.; Mohabeer, Luckeenarain, Univ. Coll. Hosp.; Mary L. Marsh, Charing Cross Hosp.; W. C. W. Nixon, St. Mary's Hosp.; A. P. M. Page, St. Bart.'s Hosp.; Oliver Plowright, Guy's Hosp.; D. C. Price, St. Bart.'s Hosp.; J. D. Ritchie, St. George's Hosp.; E. B. Rogers, Guy's Hosp.; Violet R. Sharp, L.S.M.W.; and T. S. Stone, London Hosp.

L.S.M.W. = London School of Medicine for Women.

At a meeting of the Senate on May 7th it was resolved to institute a university readership in biochemistry tenable at the London School of Hygiene and Tropical Medicine.

UNIVERSITY OF OXFORD.—Sir William Morris has offered to vest the Radcliffe Observatory site and buildings in the hands of a body of trustees, to be used for the benefit of the Radcliffe Infirmary and the Medical School of the University.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—On June 2nd Dr. Robert Grieve Hutchison and Dr. James Sharpe were admitted Fellows of Faculty.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN—Mr. A. R. Melhuish, of London, has been elected president of this society.

MEDICO-LEGAL SOCIETY.—At a meeting of this society at 11, Chandos-street, London, W., on June 26th, Prof. J. S. Haldane, F.R.S., will read a paper on Carbon Monoxide Poisoning.

BIOCHEMICAL SOCIETY.—A meeting of this society is being held on Saturday, June 14th, in the department of biochemistry of the University of Oxford.

UNIVERSITY OF LIVERPOOL.—Dr. Walter Ramsden has resigned from the Johnston Chair of Biochemistry. His resignation will take effect at the end of the year.

Colonel Alfred William Sheen, C.B.E., and Lieut.-Colonel Sir Ewen John Maclean have been appointed Deputy Lieutenants for the county of Glamorgan.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH.—A new wing of the nurses' home at this St. John's Wood hospital was opened last week. It is a memorial to the late Hon. Sir Charles Russell, who was chairman of the institution from 1919 to 1928. It has cost £15,000.

PADDINGTON MEDICAL SOCIETY.—A new regional medical society was inaugurated at a meeting held on June 10th at Paddington Town Hall. Dr. Howard Stratford took the chair, representatives were present from central medical associations, and apologies for absence were received from Dr. Christine Murrell and Dr. H. B. Morgan, M.P. for the borough. Dr. Julius Cohen, to whose initiative the society owes its origin, briefly outlined its aim which is to provide opportunity for the practitioners in the area to meet each other, to meet consultants away from the bedside, and to get to know the public officers of the health department and its associated clinics. It was intended not merely to register pious opinions but to discuss and agree upon medico-political questions of the day such as State medical service, contributory schemes, and the like. A constitution for the society was then adopted. Membership is open to all medical practitioners residing or practising in Paddington; six of the seven office-bearers must be actively engaged in medical practice in the borough itself. Dr. G. Swietochowski was then unanimously elected president, Dr. A. Baldie vice-president, and Dr. Cohen hon. secretary and treasurer; after a card vote the four additional committee members chosen were Dr. W. G. Bendle, Dr. G. E. Oates (medical officer of health), Dr. R. G. Murray, and Dr. Isabella Stewart. Dr. Swietochowski, having been inducted to the presidential chair, outlined the future work of the society, making it clear that there would be no attempt to run counter to any existing group. The growing tendency within the medical profession, for better or worse, to become a branch of the civil service, made it essential, he said, to preserve a strong local organisation to act as middle-man between the central authority and the individual practitioner. Paddington doctors would, he hoped, use the society precisely as the Romans treated their forum. At each meeting a 20 minutes paper would be read, and discussed; they would then pass to debate on current medico-political matters. At the close of the meeting most of those present enrolled as members. Meetings are to be held at 9 P.M. on the second Tuesday in the month at the Great Western Hotel, Paddington.

[1] See THE LANCET, April 12th, p. 837.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2 2 0
	Six Months	1 1 0
	Three Months	0 10 6
ABROAD	One Year	2 10 0
	Six Months	1 5 0
	Three Months	0 12 6

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, June 17th.—5.30 P.M., Ballot for Election to the Fellowship.

THURSDAY.—5 P.M., DERMATOLOGY (Cases at 4 P.M.). Dr. W. N. Goldsmith: 1. ? Congenital Ichthyosiform Erythroderma in Mother and Son. 2. Case of Juvenile Spontaneous Bullosis. Mr. Stanford Cade (introduced by Dr. S. E. Dore): 3. Demonstration on Carcinoma of the Skin Treated by Radium. Dr. H. W. Barber: 4. Icthyosiform Nævus. 5. Psoriasis. Dr. G. B. Dowling: 6. Urticaria Pigmentosa of Infantile Type Persisting into Adult Life. 7 and 8. Two Cases of Ulerythema Ophryogenes (Unna). 9. Angioma Serpiginosum. Dr. Knowsley Sibley: 10. Case for Diagnosis. Dr. S. E. Dore (for Dr. R. Oddie): 11. Case of Urticaria Pigmentosa. Other cases will be shown.

FRIDAY.—10 A.M., LARYNGOLOGY: Summer Meeting. Papers will be read by Dr. Douglas Crow, Dr. A. Brown Kelly, Dr. Dan McKenzie, Mr. W. S. Thacker Neville, Mr. E. Watson-Williams, and others. 5 P.M., Clinical Meeting. Cases will be shown by Dr. Norman Patterson, Dr. H. Bell Tawse, Mr. Mortimer Woolf, Dr. Dan McKenzie, Dr. E. A. Peters, Mr. J. F. O'Malley, Mr. Michael Vlasto, and others. The Annual Dinner of the Section with the Section of Otology will be held at the Langham Hotel, Portland-place, London, W., at 7.30 P.M. for 7.45 P.M. 8 P.M., OBSTETRICS AND GYNÆCOLOGY. Mr. A. J. Wrigley: Puerperal Infection by the Pathogenic Anaerobic Bacteria. Short Communications: Dr. H. K. Griffiths: 1. A Lithopædion. 2. A Short Account of a Pregnancy in one Horn of a Bicornate Uterus. Pathological Specimens: Mr. Eardley Holland: 1. A Case of Secondary Melanotic Sarcoma of the Placenta with Transmission of the Growth to the Fœtus; with specimens and drawings. 2. Six specimens of Recent Interesting Cases of Fibromyoma of the Uterus. Dr. J. Bamforth: 3. An Unusual Tumour of the Uterus. 4. Early Carcinoma of the Endometrium. 5. Endometrioma of the Abdominal Wall. Dr. Ivens Knowles: 6. Recurrent Melanotic Sarcoma of the Clitoris. Other specimens will be shown.

SATURDAY.—DISEASE IN CHILDREN: Annual Provincial Meeting at Norwich.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.

THURSDAY, June 19th.—8.15 P.M., General Meeting; preceded by a Demonstration at 7.45 P.M. to illustrate a paper by Dr. N. Hamilton Fairley: Sprue—its Applied Pathology, Biochemistry, and Treatment.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.

TUESDAY, June 17th.—8.15 P.M., Professor de Quervain (Berne): Cretinism and its Relation to Thyroid Physiology. (Cavendish Lecture.) Reception at 7.45 P.M.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.

TUESDAY, June 17th.—5 P.M., Sir Charles Martin: The Thermal Adjustment of Man to External Conditions, more particularly those pertaining to Warm Climates. (2nd Croonian Lecture.)

THURSDAY.—5 P.M., Sir Charles Martin. (Last Croonian Lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, June 16th to SATURDAY, June 21st.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W., Special M.R.C.P. Lectures at 8.30 P.M., as follows: Tues., Dr. O. L. V. De Wesselow, Hypotension and Renal Disease; Fri., Dr. O. L. V. De Wesselow: Diabetic and other Acidoses. BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.: Tues., 2 P.M., X Ray Demonstration by Dr. E. U. Williams. No fee. EAST LONDON HOSPITAL FOR CHILDREN, Shadwell, E.: Wed., 11 A.M., Demonstration on Ear, Nose, and Throat Cases, by Mr. G. H. Howells. No fee. BLACKFRIARS SKIN HOSPITAL, Blackfriars-road, S.E. Afternoon Course. CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W.: Mornings and/or Afternoons. PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N.: Intensive Course in Medicine and Surgery. Further particulars from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, June 16th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations. 4.30 to 5.30 P.M., Mr. H. W. Carson: Abdominal Pain in Children.

TUESDAY.—2.30 to 5 P.M., Medical, Surgical, Ear, Nose and Throat Clinics. Operations. 4.30 to 5.30 P.M., Dr. J. B. Alexander: Various Forms of Treatment of Pulmonary Tuberculosis.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat, and Ear clinics. Operations. 4.30 to 5.30 P.M., Mr. Aubrey Goodwin: The Use of Pessaries.

FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M., Medical, Surgical, and Children's Diseases Clinics. Operations. 4.30 to 5.30 P.M., Mr. E. Gillespie: Surgery of the Stomach.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, June 16th.—12 noon, Dr. Greenfield: Cerebro-spinal Fluid. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Kinnier Wilson: Varieties of Peripheral Neuritis.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Grainger Stewart: Spinal Tumours and Compression Paraplegia.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Gordon Holmes: Lesions of the Cerebellum.

FRIDAY.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of the Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Walshe: Disorders of the Motor System.

Appointments.

CLARK, J., M.D., Ch.B. Aberd., D.P.H., has been appointed Deputy Medical Officer of Health, Sheffield.

PATEY, D. H., M.S., M.B. Lond., F.R.C.S. Eng., Assistant Surgeon to the Middlesex Hospital.

ROBERTSON, E. M., M.B., Ch.B. Glasg., D.P.H., Assistant Medical Officer of Health for Hyde.

TAIT, A., M.B., Ch.B. Edin., Certifying Surgeon under the Factory and Workshop Acts for the Markinch District of the County of Fife.

WALTON, W. S., M.B., B.S. Durh., D.P.H., Assistant Medical Officer of Health for the City and Port of Plymouth.

Vacancies.

For further information refer to the advertisement columns.

Bath, Royal United Hospital. H.P. £120.

Birkenhead County Borough.—Asst. M.O.H. and Bacteriologist. £750.

Birmingham, City of.—1st Asst. M.O. £600.

Birmingham, Midland Hospital, Easy-row.—H.S. £150.

Blackburn Royal Infirmary.—Res. H.P. £175. Also 4th H.S. £150.

Brighton, New Sussex Hospital for Women and Children.—Hon. Asst. Ophth. S. Also H.P. £50.

Brighton, Royal Alexandra Hospital for Sick Children.—H.P. £100.

Cancer Hospital, Fulham-road, S.W.—Pathologist. £850.

Cardiff, Cefn Mably Hospital, Michaelstone-y-Vedw, near Newport.—Asst. Res. M.O. £250.

Cardiff Royal Infirmary.—Res. Reg. £100. Cas. Surg. O., and H.S. to Ophth. Dept. Each at rate of £75.

Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall, Great Barrow.—Asst. M.O. £275–£300.

Chesterfield and North Derbyshire Royal Hospital.—Cas. O. At rate of £200.

Colchester, Royal Eastern Counties' Institution for Mentally Defective.—Clin. Research Worker. £600.

Countess of Dufferin's Fund, Women's Medical Service for India.—Two Medical Women. 550 and 750 rupees per mensem.

Coventry and Warwickshire Hospital.—Res. Asst. H.S. £125.

Derby, Derbyshire Royal Infirmary.—Asst. H.S., and Cas. O. Also Ophth. H.S., and Res. Anæsthetist. Each £150.

Doncaster Royal Infirmary.—Hon. Phys. and Pathologist. £250.

East London Hospital for Children, Shadwell, E.—Dermatologist.

Gloucester, Gloucestershire Royal Infirmary.—2nd H.S. At rate of £100.

Golden-square Throat, Nose, and Ear Hospital, W.—H.S. £100.

Great Yarmouth General Hospital.—H.S. £150.

Halifax Royal Infirmary.—3rd H.S. At rate of £125.

Harrow Hospital, Harrow-on-the-Hill.—Surgeon.

Hertford County Hospital.—H.P. At rate of £150.

Hospital for Sick Children, Great Ormond-street, W.C.—Part-time Jun. Cas. O. At rate of £150.

Hull Royal Infirmary.—H.S. At rate of £150.

Hyde, Borough of.—M.O., &c. £800.

Indian Medical Service.—Commissions.

Ipswich, East Suffolk and Ipswich Hospital.—H.P. £120.

Islington Dispensary, 303, Upper-street, N.—Asst. Res. M.O. £220.

Leamington Spa, Warneford General Hospital.—Res. H.S. £165.

Lincoln County Hospital.—Jun H.S. at rate of £150.

Liverpool, Royal Southern Hospital.—H.P. H.S. Also M.O. to Spec. Depts. Each at rate of £60.

L.C.C. Mental Hospital Service.—8th Asst. M.O. £445.

London Female Lock Hospital, 283, Harrow-road, W.—H.S. £150.

London Panel Committee, 17, Russell-square, W.C.—Organising and Asst. Med. Secy. £600.

London University.—Graham Scholarship in Pathology. £300. Also External Examinerships.

Manchester, Ancoats Hospital.—H.S. At rate of £100. Also Clin. Asst for Ear, Nose and Throat Dept. 10*s.* 6*d.* per clinic.

Manchester, Baguley Sanatorium.—Asst. M.O. £350.

Manchester Ear Hospital, Grosvenor-square, All Saints.—Non-Res. H.S. At rate of £150.

Manchester Royal Infirmary.—Asst. Surg. O., and Asst. M.O. Each £35.
Manor House Hospital, Golders Green.—Jun. Med. Officer. £300.
Margate and District New General Hospital.—Res. M.O. £125.
Mount Vernon Hospital, Northwood, Middlesex.—Gynæcologist.
Newark General Hospital.—Res. H.S. At rate of £150.
Northampton General Hospital.—Asst. H.S. At rate of £150.
Norwich, Norfolk and Norwich Hospital.—H.S. £120.
Paisley District Asylum, Riccartsbar.—Clin. Asst. £200.
Portsmouth Royal Hospital.—Cas. O. At rate of £100.
Pretoria Onderstepoort Veterinary Research Laboratory.—Three Research Fellowships. £800–£1000.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Res. M.O. £200.
Queen Mary's Hospital for the East End, Stratford, E.—H.P.'s and H.S.'s. Each £120. Also H.P. and Cas. O. £150.
Queen's Hospital for Children, Hackney-road, E.—Res. M.O. At rate of £200. Also Asst. Physician.
Reading, Royal Berkshire Hospital.—H.P. Cas. O. Also Res. Anæsthetist. Each at rate of £150.
Richmond, Surrey, Royal Hospital.—Hon. Asst. Radiologist, Hon. Surg., and Hon. Asst. P. to Out-patients.
Rotherham Hospital.—Sen. H.S. £200. Also H.P. £180.
St. Bartholomew's Hospital, E.C.—Surgeon to Throat Dept. Also Asst. Physician.
St. Helens County Borough.—Asst. M.O.H. £600.
Salford Royal Hospital.—Hon. Asst. S. Also H.P., H.S., and Cas. H.S. Each at rate of £125. Also Anæsthetist. 1 gn per session.
Sheffield Children's Hospital.—3rd Res. M.O. £100.
Sheffield Royal Hospital.—Res. Anæsthetist. At rate of £80.
Sheffield Royal Infirmary.—H.S. £80.
Southwark Hospital, East Dulwich-grove, S.E.—Med. Supt. £1200.
South Shields, Ingham Infirmary.—Sen. and Jun. H.S.'s. £200 and £150 respectively.
Southampton Borough Hospital.—Res. M.O. £275.
Southampton, Royal South Hants and Southampton Hospital.—Sen. H.S. £225. Also Asst. H.S. £180.
Southport General Infirmary.—Jun. H.S. £100.
Surrey County Council.—Asst. M.O. £600.
Swansea County Borough.—Asst. M.O. £600.
Truro, Royal Cornwall Infirmary.—H.S. £170.
Univeristy College Hospital, Gower-street, W.C.—Hon. Anæsthetist.
Walsall General Hospital.—Cas. H.S. At rate of £120.
Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £150.
West London Hospital, Hammersmith, W.—Res. Asst. Phys. £300.
Weymouth and District Hospital.—H.S. £180.
Wigan Royal Infirmary.—Res. Med. and Surg. O. and Registrar £250.
Willesden General Hospital, N.W.—Clin. Asst. to Surg. Out-patient Dept.
Winchester, Royal Hampshire County Hospital.—Sen. Res. M.O. £200. Also H.P. and H.S. Each £150.
Worcester General Infirmary.—Jun. Res. M.O. £120.

The Home Secretary gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act for the Districts of the Boston, Holbeach, Sleaford, Spalding, and Spilsby County Courts (Circuit 17). Applications should reach the Private Secretary, Home Office, Whitehall, London, not later than June 28th.

Births, Marriages, and Deaths.

BIRTHS.

CRISP.—On May 30th, at Oakham, Rutland, the wife of G. H. Crisp, B.M., B.Ch., of a daughter.
FEILDEN.—On June 6th, 1930, at 28, The Drive, Hove, the wife of Frederick E. Feilden, F.R.C.S. Edin.—a daughter.
ROPE.—On June 2nd, at Quarry-place, Shrewsbury, the wife of Dr. A. D. Rope, of a daughter.

MARRIAGES.

MACKENZIE—CAVE.—On June 3rd, at St. Andrew's Parish Church, Malahide, Co. Dublin, Kenneth Fitzgerald Mackenzie, M.B., F.R.C.S., to Sylvia Dorothea, only daughter of the Rev. Henry C. Cave, M.A., and Mrs. Cave, of the Rectory, Malahide, Co. Dublin.
ROUTH—SCOT SKIRVING.—On June 7th, at the Parish Church, Cheltenham, Douglas James Lionel Routh, M.R.C.S., L.R.C.P., to Estelle Elisabeth, youngest daughter of Mr. and Mrs. E. Scot Skirving, of Kilchoman, Cheltenham.

DEATHS.

BRADBURY.—On June 4th, at St. Peter's-terrace, Cambridge John Buckley Bradbury, Downing Professor of Medicine.
CANDY.—On June 1st at Frondeg, Stow Hill, Newport, Mon., Thomas Ignatius Candy, M.B., B.Ch., B.A.O., D.M.R.E., aged 38.
GEE.—On June 2nd, at the Royal Northern Hospital, following an operation, Lieut.-Col. Frederick William Gee, I.M.S. retd., C.I.E., M.B., B.Sc., M.R.C.S., of Westmead, Cookham, Berks.
HAMMELL.—On May 30th, at Sydenham, suddenly, Donald H. Hammell, L.D.S., D.D.S., of Wimpole-street, W.
WAKEFIELD.—On June 6th, in France, Robert Clark Wakefield, M.D., late of Mapesbury-road, Brondesbury, aged 67.
WOOLDRIDGE.—On June 6th, at Camberley, Arthur Tylee Wooldridge, M.R.C.S., L.R.C.P., L.S.A.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

Notes, Comments, and Abstracts.

ECONOMIC ASPECTS OF MEDICINE.

BY LEONARD P. LOCKHART, M.D. CAMB.,
BARRISTER-AT-LAW.

THOSE who have watched the progress of social services since the war must have been greatly struck by Sir Arthur Keith's recent address to the Medical Society of London[1] on the "Inexorability of the Law of Evolution as Manifested in Modern Medicine." While stating nothing that is not already accepted, Sir Arthur presented it to the reader in such a way that in his train of argument he exemplified that very law of evolution upon which he based his thesis. He comes finally to a conclusion, which from such a source cannot fail to prove arresting, that "we cannot escape State control in the long run." Certainly this may be the outcome of the series of events in which we are all now playing a part, but it would be fruitless to argue as to whether or no State control will ultimately prove beneficial to medical science because by the time it comes to fruition it will probably bear as much resemblance to our present conception of State control as the battle of Jutland bore to Trafalgar—a difference not only of degree but of kind. Our present conception of State control is dominated by the idea of an ever-increasing bureaucracy in Whitehall, but it is unlikely that the present system will expand indefinitely. Already it is becoming obvious that over-organisation is a malignant and ultimately fatal disease in any corporate body, so much so that in certain industries there is a tendency to organise small self-contained units in parallel rather than in series—a confederation of self-governing states rather than a centrally controlled empire.

The time factor in civil evolution is important, because it is evident from historical records that mere passage of time is not necessarily synonymous with progress, for in the sphere of civil and social growth the biological law is not by any means valid—violent retrogressions unknown in the animal world result from hasty and ill-considered forward rushes such as in nature never can take place—and it may be that Sir Arthur Keith has placed unwarranted confidence in the evolutionary value of time. Perhaps, after all, disintegration is as likely to be the outcome of our present system as continued integration, but no one would on that score presume to question Sir Arthur Keith's statement that the main feature of the law of evolution is its inexorability. One may, however, question the completeness of the analogy between physical and mental evolution, and there is at least a doubt whether the evolution of medicine and other social services is not liable to disintegrate the spirit of man and, even if such a setback should prove but temporary, the human mind is likely to seek some more trustworthy ladder of ascent once it has recovered its poise. At a time when the British Medical Association is presenting for criticism a policy for a general medical service for the nation, it may not be out of place to recall to the minds of our profession a point which is repeatedly lost sight of, and which has even escaped mention in Sir Arthur Keith's paper—namely, the interdependence of medicine and industry. Neither can exist without the other, and yet the intimate and vital connexion is so frequently lost sight of that disintegration at this very point might very easily prove the undoing of Sir Arthur's hypothesis.

Interdependence of Medicine and Industry.

Dr. Erwin Liek goes so far as to make a statement that Germany lost the Great War because the moral character of the nation had been undermined by the social insurance system. Supposing this statement to be no more than a mere personal opinion, it is at least one held in part by a great number of thoughtful persons in connexion with our own social system, and it follows that social insurance is at once a concomitant of evolutionary progress, and at the same time the harbour of a disintegrating force which is slowly sapping our moral fibre. It is clear that Sir Arthur visualises an idealised form of social service, while Dr. Liek only considers the uses and abuses of the present system, with a distinct bias towards the latter. It is probable that we have not yet learnt how properly to handle the social insurance problem, and that it is not the system which is at the root of the trouble but its faulty application. Misuse is by no means always intentional or negligent; more often than not it springs from a misconception, and it is impossible to avoid the conclusion that our profession as a whole is not adequately informed on the industrial situation as it affects not only the insured person but the nation as a whole. It needs but a little reflection for everyone to

[1] THE LANCET, May 17th, p. 1053.

realise the immense importance of a proper understanding of the inner workings of modern industry. We are without doubt in danger of producing an industrial population which is propped at every turn by social insurance, and unless everything possible is done to discourage excessive dependence on the props we shall find ourselves with a demoralised population and inevitable bankruptcy of the funds. A desire to use the funds as little as possible is essential in all insurance, and benefits should only be drawn on in emergencies, not at regular intervals as a prize for abstention in the interim.

The American view on this matter is illuminating. It is widely held in the United States that wealth is not *in* industry, but that wealth *is* industry, and that every single thing which is given for nothing or in return for inadequate service is in effect so much actual poverty grafted on to the nation. Thus abuse of any system of insurance is wilful robbery of other people's livelihood and high treason against the State.

Abuse of the Insurance Principle.

A common form of abuse is exemplified by the additional benefit for ophthalmic treatment. A patient breaks his or her glasses or desires a newer type of frame, whereupon, withholding information regarding existing appliances, he asks some doctor (any doctor will do) for a certificate to the effect that the condition of his eyes is prejudicial to his health. A patient recently refused a certificate by the writer retorted that she had not "had anything out of the insurance for six years!"

A medical man who exercises his judicial function over certification in this and other matters stands to lose at the hands of disgruntled patients, and in an age of extensive certification for a multitude of purposes it is a matter serious enough to call for some form of protection for the doctor, for the economic pressure is great. If no benefit could be drawn except by the production of a certificate on a form previously obtained by the patient from the approved society or other interested body, and if every doctor who felt it his duty to refuse the certificate was called on to note that fact on the form it would be impossible for any other medical man subsequently approached to reverse that decision in ignorance of the previous refusal, and the spectacle of one medical man set off against another would be avoided.

On the other hand there is often a failure by the doctor to realise to the full the import of certain very innocent looking words when used on certificates. "Fit for light work" often causes a lot of trouble, because the patient knows full well that in modern industry the provision of light duty is, except in rare and isolated cases, next to impossible. There is not enough light work for 2 per cent. of any large staff; the reason being that in heavy industries there is little really light work, and in the big repetitive workshops there is a minimum of really heavy duty. A certificate bearing the words in question often means that a patient considers himself far worse than he really is, because his idea of light work and the doctor's are quite different. Many doctors still think in terms of coal, iron, and steel, and forget the enormous growth of light repetitive processes. Heavy work is being increasingly performed by machinery, and in the coming age of machine-tenders light work and ordinary work are very nearly synonymous terms. The team organisation of mass production prevents much individual laxity in hours for the convalescent employee, so that to-day one is either fit or unfit, and there is a tendency in certification to err on the side of excessive safety. An inside knowledge of local industrial operations is invaluable for arriving at a right decision.

The Off-work Neurosis.

A determined effort by the profession to eliminate from certificates, except in cases of absolute need, the words "nerves, neurasthenia, anæmia, depression, cardiac debility, weak heart, &c.," would go a long way towards reinforcing that aspect of psychotherapy—suggestion—which is invaluable to the convalescent. There is a definite "off-work" neurosis, and it is certain that many patients wait for their doctors to suggest their ability to work, and that symptoms psychological in origin persist until that suggestion comes, but the doctor defers the urge to work because of the continuing symptoms. There is a danger, too, of our encouraging a tendency to introspection among young people when we allow them to become unduly preoccupied over conditions which are in the main environmental, and for which work is the best cure. Our social insurance has saved an immensity of suffering, but in the elimination of suffering may we not lose something of our moral fibre? It is on our shoulders that the responsibility will lie. Too many ailments, from chapped hands to constipation, are ascribed to occupation, and certificates given to this effect, often by certifying surgeons. The result in many cases is that employees lose their jobs because they are too expensive to keep, and the risk of a recurrence too great. Modern industry *is* the nation. We must help it, and not be always hampering it with restrictive charges which ought not to be placed on it. The Workmen's Compensation Act is a great measure of social welfare, but it is a two-edged sword, and many employees have reason to doubt its beneficial action.

When our profession and the courts of law begin to take a wider view of this matter it will be possible to take steps to give better employment to the cripples and the partially disabled. At present restrictions and the threat of legal action make it essential for wise employers to select only the most physically fit. In this way the less fit are left in idleness or in the lower grades of employment, and any chances they might have of raising themselves and their offspring to higher levels are permanently dashed, to the great disadvantage of the nation. Old age pensions at 65 and the new proposal to raise the school age, even with its attendant costs and immoral maintenance allowance, both have good features, but they are not unmixed blessings, and though both are in reality an attempt to square the fall alike in birth- and death-rates with the passing phase of under-employment they both levy a toll of industrial victims.

Fair Play to Industry.

Industry is still looked on as a stalking horse. Big corporations fail to get justice in the medical man's mind merely because they are big and supposedly rich, but the margin between profit and loss under present-day conditions is often very small, and industry can only survive, prosper, and pay wages if everything is done to assist it to perform its function. Out of industrial profits our profession is supported directly and indirectly, and our social advances depend on the ability of industry to pay. Therefore we must not look on the industrial worker as one who is always in need of protection from his employer, and especially must we be on our guard against charging against the employer the costs of the ordinary risks of life—certifying them as occupational, and to that extent depleting the employing power of industry.

Every certificate is a fiduciary act, and can only be rightly given when all the facts are known. A wider inside knowledge of industrial and commercial procedure would enable our profession to render a service to British industry which would rank as a first-class measure of safeguarding.

SURGICAL NEEDLES.

To the Editor of THE LANCET.

SIR,—In view of recent correspondence in the press concerning the antiquity of the sewing needle, the following information may prove interesting to the readers of your journal. Mr. Harford Lowe, F.G.S., has investigated the use of the needle by primitive man in the Stone Age and has an enlightening theory that it may be considered as the lever which primarily lifted man above the condition of the brute.

The surgeon's needle can only be produced by old-fashioned hand processes owing to the large number of models designed to meet the special needs of modern surgery. This is undoubtedly well from the point of view of the surgeon as it ensures a degree of quality that only trained craftsmanship can give. Needles for surgical use devised from stone, ivory, and bone have been unearthed with collections of surgical instruments used by the early Romans and ancient Greeks, so one imagines that the Chinese, Japanese, and Egyptians during their development thousands of years ago must have fashioned needles from these same substances whether for some gorgeous embroidery to be worked, or the intricacies of a masterpiece in tapestry, or for the closing of a wound at a surgical operation in those pre-Lister days. So far as available records show it appears that the earliest steel surgeon's needles were made in the year 1810 by one Emanuel Shrimpton, whose son Emanuel in the year 1830 migrated to Redditch in company with other makers of various kinds of needles.—I am, Sir, yours faithfully,

June 6th, 1930. ACUS.

KING EDWARD'S FUND.

THE annual report of King Edward's Fund shows that the receipts for the last 12 months were £535,435, of which £115,000 represented the Thankoffering Fund for the King's Recovery. The ordinary distribution amounted to £250,000, and the special distributions brought the total expenditure to £378,000. Since the foundation of the fund in 1897 a total of £6,488,000 has been distributed. The year's expenses were £13,930—about 6½*d.* per £1 of the total received. The accompanying report of the Voluntary Hospitals (Parliamentary) Committee sets out the reasons for the clause in the Road Traffic Bill authorising payment to hospitals treating patients injured in motor accidents, and adds that "as the Bill provides that, by means of compulsory insurance, there shall be funds out of which legal charges for the cost of the treatment of such injured persons shall be met, it is equitable that provision should at the same time be made for meeting the cost of hospital treatment; and that it is reasonable that the cost of treating these cases should be borne by the insurance of motorists rather than by the funds subscribed by the charitable public for the support of their local hospitals."

Observations ON DIVERTICULITIS.*

BY E. G. SLESINGER, O.B.E., M.S., F.R.C.S.,
ASSISTANT SURGEON TO GUY'S HOSPITAL.

DIVERTICULA of the colon were first described by Cruveilhier in 1849, and the first description in English was by Habershon, physician to Guy's Hospital in 1857, who published an excellent account of the condition as seen in post-mortem material. Guy's has a particular interest in this subject, for the first illustration of diverticula of the colon appeared in a paper by Arbuthnot Lane, published in *Guy's Hospital Reports* in 1885. In spite of these early and excellent accounts, however, it was not until some twenty years ago that the pathological and clinical importance of the condition came to be recognised, and it is only since the technique of radiographic examination of the colon has been perfected that the early stages have become known and its clinical features and appropriate treatment have been worked out.

Diverticula of the colon are very much commoner than is generally realised, and the figures from the Mayo Clinic show that they are to be found in roughly one person in every eight over the age of 45. Their commonest site is in the sigmoid, and in about 40 per cent. of cases they are confined to this region of the bowel. In a further 30 per cent. of the cases diverticula are found scattered throughout the colon, including, of course, the sigmoid, and in the remaining cases they are situated in the splenic flexure, transverse colon, cæcum, or rectum. The ascending colon is almost never involved. The important point to remember, however, is that the sigmoid is affected either alone or in association with other parts in over 70 per cent. of cases; it is primarily as a disease of the sigmoid that we shall consider the matter to-day.

F. de Quervain and E. I. Spriggs independently have suggested that the term diverticulosis should be used to describe the mere presence of diverticula and that diverticulitis should be reserved for the cases with those additional inflammatory changes which are responsible for all the severe symptoms and complications which may ensue. The diverticula vary in size from almost microscopic dimensions to from 2 to 4 cm. in diameter, but they very seldom exceed that size. They occur in a part of the intestine which is usually loaded with fat, and frequently tend to grow into the appendices epiploicæ, with the result that in situ they are difficult to distinguish, and all that is visible is a tuberous appearance of the bowel. When, however, the fat is stripped off, the diverticula are seen as typically bluish-black flask-shaped outpouchings set roughly in two parallel rows. The blue-black colour is due to the fact that the mucosa and submucosa have herniated through the muscular wall and the colour of the fæcal contents is seen through the thin wall. Usually a whitish strip or collar can be made out round the neck of the diverticulum which marks the limit of the muscular covering. The points in the circumference of the bowel at which the diverticula appear vary somewhat, but the commonest site is between the mesocolic and the antimesenteric longitudinal muscle bands, and as that is where the vessels pierce the muscular wall it seems probable that this point of entry of the vessels forms a weak point in the circular muscle layer.

The diverticula are usually full of fæcal material and enlarge as more bowel content is forced into them, and as they do so they very often force their way into the appendices epiploicæ.

* Based on a lecture delivered at Guy's Hospital.

ORIGIN OF THE DIVERTICULA.

From the ætiological point of view the first point to consider is whether these diverticula are congenital or acquired. While occasional congenital diverticula do undoubtedly occur, there can be no doubt that the majority are acquired, as is proved by the fact that they almost invariably occur in middle and later life, while their development has often been watched for several years by X ray examination; 85 per cent. of a series of 100 cases examined by R. Mailer occurred between the ages of 40–70, and the condition is about twice as frequent in men as in women.

Spriggs and O. A. Marxer, as the result of careful radiological study, describe what they term a pre-diverticular state in which there is irritation and inflammation of the whole circumference of the bowel, and they believe that the herniæ occur owing to damage to the muscle-fibres during this stage. There can be no doubt that diverticulosis is almost always associated with septic foci elsewhere—such as septic teeth, arthritis of the spine, or cholecystitis—which would provide a focus for infection. Other views of the cause of these herniæ are that they are the result of the increased pressure resulting from constipation on a weak and degenerating musculature, or that they are due to weakness at the point of entry of the blood-vessels. R. Davies-Colley holds that they are the result of a muscle degeneration due to the pressure of an abnormal amount of fat round the colon, but Spriggs has shown that these patients are no fatter on the average than normal control patients, and many cases of diverticulosis have been found in thin and wasted individuals.

ORIGIN OF SYMPTOMS.

It is doubtful whether the presence of diverticula by themselves gives rise to any symptoms at all, except possibly those due to the hypothetical sigmoiditis which Spriggs suggests is responsible for their formation. The symptoms that do arise are due either to mechanical or to inflammatory changes in them.

The mechanical changes are the lodgment in the diverticula of fæcal concretions. These gradually increase in size as more material is forced into the pouch from the constipated colon, and cases of so-called "pistol shot" perforation have been described by Murray where there is no inflammatory ulceration but where the concretion is forced through the thin-walled sac by the peristalsis of the bowel.

The inflammatory changes are, however, by far the commonest and most important, and may be either acute or chronic, while very frequently the case comes under notice because of an acute exacerbation of a chronic infection. In acute infections, which are very rare, the changes in the diverticulum are similar to those seen in acute appendicitis, and gangrene and perforation may ensue in a few hours, leading to generalised peritonitis.

Last year, in consultation with Dr. D. M. MacManus, I saw a woman of 65 who was quite well until 10 o'clock one morning, when she began to have severe pain in the left iliac fossa. This continued until noon when she had a collapse marked by sweating, fainting, coldness of the extremities, and a very feeble pulse. She rallied from this collapse, and when I saw her at 4 P.M. she had marked rigidity and tenderness of the lower abdomen on both sides, with pain more in the middle than it had been. I operated on her and found her peritoneum full of pus, and she had diverticulitis of the sigmoid with a perforation of one of the diverticula which was gangrenous at its tip. I closed this and covered it with fat, and instituted slow irrigation of the peritoneal cavity by means of Carrel tubes with saline, and she made a good recovery.

The commoner change is one of chronic inflammation which is associated with much thickening and rigidity of the bowel. The fat of the colon becomes coarse and granular, the mesentery is thickened and shortened, and the area of colon affected becomes hard and rigid and is very frequently mistaken for a growth on abdominal exploration. It is in the highest degree probable that the patients one sees

sometimes surviving for long periods after colostomy performed for growth of the sigmoid were really suffering from diverticulitis and not growth; for it is often impossible to tell the difference from the outside, and it is often difficult to do so even when the bowel has been opened.

As the result of this chronic inflammation there may be very various secondary pathological results, of which the commonest are peritonitis of varying grades—either generalised peritonitis, pelvic peritonitis, abscess formation, or the formation of adhesions to the bladder or small intestines or side wall of the pelvis where the adhesions not infrequently involve the iliac vessels and the ureter. Later still perforation of a diverticulum may give rise to fistulæ of various types, of which the commonest is between the bowel and the bladder, though cases occur of fistulæ communicating with other hollow viscera.

Diverticulitis is by far the commonest cause of vesico-colic fistula—a far commoner cause of this condition than is cancer. Such a fistula may be in the nature of a direct communication between a diverticulum and the bladder, or may take place by way of an abscess cavity formed between the bladder and the inflamed colon. It is an interesting fact that the presence of a hard tumour in the bowel, accompanied by the passage of gas and fæces per urethram, is in the great majority of cases due to diverticulitis, yet when one sees these cases the tendency to make a diagnosis of cancer is very strong indeed. Although this fact is well recognised by all those who have studied this condition, there are still many patients who are denied the opportunity of surgical relief owing to the diagnosis of cancer being made, so that I want to lay stress on this point.

Clinical Varieties.

When we come to consider the clinical features of diverticulitis we find a variety of picture depending on the stage of the disease with which we are dealing. As in so many other diseases, a good deal of confusion arises from the fact that the first cases to be described were late cases, cases with complications, and that for a long time the clinical picture was based entirely on these late cases. Symptomatology is probably the department of surgery which needs a complete overhaul more than any other. It needs an overhaul which will disentangle the symptoms of the disease from those of its results, and which will enable us to diagnose conditions capable of repair without having to wait for resulting destructive lesions to give us the so-called typical symptomatology. Cholecystitis and duodenal ulcer are two of the conditions which have been successfully rescued from this muddle of symptomatology, so that we can now diagnose them successfully without waiting for their complications, and consequently treatment, both medical and surgical, can be carried out with reasonable hopes of success because irreparable damage has not yet been done. To return to the question of diverticulitis, it should be and is possible to diagnose this condition in the early stages, and when that is done treatment is usually very successful. In any patient over the age of 40 who complains of discomfort in the lower part of the abdomen, and especially in the left iliac fossa, associated with constipation, irritability of the bladder, and occasional attacks of slight pyrexia, diverticulitis must be thought of as a probable diagnosis. In such a case there is nearly always tenderness in the left iliac fossa or over the pubis, and there may be thickening of the iliac colon or a definite tumour in this region. Examination by a competent radiologist will confirm the diagnosis.

In the later cases a variety of symptoms are present, and they can be grouped roughly into three types, according to the locality and extent of the inflammatory spread—namely, the inflammatory type, the obstructive type, and the genito-urinary type. In the first group acute *inflammatory* attacks may occur which are very similar to those of appendicitis, but situated on the left side. These attacks may begin quite suddenly with acute pain after a heavy meal, when straining at stool, after an aperient, or during the administration of an enema, and in other cases the attacks have begun while at work or at play. Their severity varies as much as it does in appendicitis, from the severe case with a rapid generalising peritonitis such as the woman I mentioned, to milder types with abscess formation or merely resulting in the formation of adhesions. The local signs are similar to those in appendicitis, but on the opposite side, and patients often describe the pain as radiating into one or both testicles or to the vagina in women. If the rigidity is not great an elongated tender tumour may be felt in the region of the iliac or sigmoid colon, and this tumour can often be felt better on bimanual examination than from the abdomen alone.

If the tumour is present it is often found to diminish greatly or even to disappear after the attack, to reappear again in the next one. The *obstructive* type is the one most often mistaken for a carcinoma, and often the history and symptoms are strikingly similar. There is usually a life-long history of constipation, and this is found gradually to increase until the patient is completely obstructed. Associated with the obstruction there is a good deal of pain and tenderness in the left iliac fossa and often considerable pyrexia, which is, of course, unusual in carcinoma. There is seldom blood or mucus in the stool, even occult blood being usually absent. Patients often notice that their pain is better when their bladder is empty, and worse when it is full. A moderate polymorphonuclear leucocytosis is common and further helps to distinguish the condition from carcinoma.

In the third or *genito-urinary* group the main symptoms are referred to the bladder. In all types of diverticulitis frequency of micturition and a burning pain at the beginning or end of the act is common, but in the type of case I am speaking of now more acute symptoms are present. There is often a history of increasing constipation and intermittent pain in the left iliac fossa or the perineum for a week or so before the attack. Then there is a sudden attack of urgent burning and painful micturition, accompanied by the passage of small grape-seed-like fæcal particles from the urethra and of audible gas at the end of micturition. The urine is heavy with sediment and has a fæcal odour. The passage of gas relieves the severe pain, but frequency and urgency persist, accompanied by cystitis of varying degree until operative relief is given. In such a case cystoscopy will demonstrate the fistula usually situated on the lateral wall of the bladder.

Diagnostic Methods.

In the diagnosis of diverticulitis, cases with acute complications, such as a general peritonitis, peritoneal abscess, or vesico-colic fistula will, of course, be recognised from the symptoms of the complication, and diverticulitis will be remembered as one of the causes of these complications. Whenever any inflammation has occurred round the diverticula, however, there will be pain and discomfort with associated tenderness, and often the inflamed area can be palpated through the abdominal wall. Irregular pyrexia, moderate leucocytosis, absence of blood from the stools, and irritability of the bladder help to confirm the diagnosis.

Patients with diverticulitis are usually but not always well covered with fat, and generally give a life-long history of constipation.

Sigmoidoscopic examination is useful in putting out the possibility of a carcinoma of the recto-sigmoid with fæcal retention above it, but usually in diverticulitis the area affected is beyond reach. Nevertheless cases have occasionally been recorded where the mouths of the diverticula have been seen to open through the sigmoidoscope on inflation.

X rays, however, afford the only means of diagnosing the presence of diverticula with certainty. Both an opaque meal and an enema should be used, as though it is the latter which will usually demonstrate the diverticula, the former will give most help in esti-

mating the degree of their effect on the functions of the bowel. Usually typical rounded oval or crescentic shadows of the barium in the diverticula will be recognised, and often are best seen after the barium enema has been evacuated, when two rows of small rounded shadows with narrow necks connecting them with the bowel can be seen. They may be visible for several days after the enema has been given. Marxer has pointed out, however, that these shadows are not the characteristic features. These are the spike or palisade-like projections of barium shadows from the lumen of the bowel, the wall of which is thickened and fixed. A series of films taken at short intervals, when superimposed, shows no variation in the outline of these shadows, although there may be vigorous and irritable contractions of the bowel wall above and below. This method of examination of superimposed serial films is of great value in estimating the degree of diverticulitis as opposed to diverticulosis which is present.

There are two fallacies to be remembered in regard to X ray examination in these cases. One is that the degree of obstruction shown after a barium enema is often a considerable exaggeration of the true state of affairs, since a good deal of spasm is induced in these irritable colons by the stimulus of the enema. The other is that in the cases with much thickening from inflammation, the diverticula may not show in the radiogram at all, in which case reliance must be placed on the demonstration of an area of rigidity and on the irregular palisading of the contents of the colon.

There is considerable diversity of opinion as to the frequency with which carcinoma develops in a colon the subject of diverticulitis, if indeed it does so at all. W. J. Mayo reported the presence of carcinoma in 13 out of 42 cases, but Judd and Pollock, from an examination of specimens, believe that a patient with diverticulitis is no more liable to develop carcinoma than a normal patient, and that is the view I am inclined to agree with. The clinical distinction between carcinoma and diverticulitis may, as I have said, be very difficult; many cases have been operated on and the specimen removed under the impression that it was a carcinoma, and the mistake has not become apparent until microscopic sections were examined. Tenesmus and painful defæcation are commoner in carcinoma, as is the passage of blood in the motions. Mucus may be passed in both conditions, but it is commoner in carcinoma. Pain is present in both diseases, but in carcinoma usually radiates through to the back which it very seldom does in diverticulitis. Pyrexia and leucocytosis are usual in diverticulitis and rare in carcinoma, and, as I have said, the presence of a vesico-colic fistula is very much more in favour of diverticulitis than of growth.

TREATMENT.

In regard to treatment we must consider the prophylactic, the medical, and the surgical treatment. As to prophylaxis, if diverticula are discovered accidentally during a routine radiographic examination of the colon, their significance must be explained to the patient and treatment must be directed to preventing the stagnation of hard fæces in them. Sufficient paraffin must be given to keep the motions soft, and a diet should be chosen which leaves the minimum of solid undigested residue. Salads, green vegetables, pips and skins of fruit, currants, raisins, &c., must be prohibited, and articles of diet which stimulate peristalsis chemically should be eaten freely. When actual diverticulitis is present, if the attack is a mild one and complications such as peritonitis are absent, medical treatment should be tried. This will consist in complete rest in bed until pain, tenderness, rigidity, and pyrexia have disappeared and the diet just mentioned should be instituted. Paraffin (8 to 10 oz.) should be slowly run into the bowel under low pressure every evening, and if possible be retained overnight, and should be slowly washed out with saline in the morning. Atropine must be given, either alone or with hyoscyamus, either by mouth or hypodermically, to counteract spasm, and purgatives should be avoided. As soon as the attack begins to abate, paraffin by mouth should be given, and the rectal paraffin may be reduced in amount and frequency. By these means attacks will be found to subside in many cases, and even if surgery is called for in the treatment of some complication this type of medical treatment will often avoid a recurrence or the necessity of the severe procedure of resection.

In regard to surgical treatment, the first point I would like to impress on you is that any attempt at radical removal of the area of bowel affected should never be undertaken in the presence of peritoneal infection. Such a procedure is almost certain to kill the patient. In the cases with general peritonitis the treatment must, in the first place, be directed to that alone, and drainage with Carrel tube irrigation in my view holds out the best chance of recovery. In the less acute cases with abscess formation, the abscess should be drained and a colostomy or cæcostomy performed. After a colostomy the inflammatory mass will often subside with surprising rapidity, and the colostomy may be closed, or resection of the affected area of bowel may be undertaken later. It is in the obstructive type of case, with tumour formation and gradually increasing stenosis, that resection is most often called for, and these cases are difficult and call for very careful surgical judgment if a disaster is to be avoided. In occasional cases a primary resection of the area affected with end-to-end union is possible, and should usually be done over a tube, but the temptation to perform this attractive method of relieving the patient often has to be resisted on account of the dangers of leakage from a junction performed low in the pelvis and often between inflamed segment of bowel. The safest way to resect these cases where possible is the three-stage method of Mickulicz. In this operation the first stage consists in bringing the diseased segment of bowel outside the abdomen and fixing it there over a glass rod. This is sometimes not so easy as it sounds, owing to shortness of the mesentery, but careful separation on the outer side of the mesentery will often make it possible. In a few days the affected bowel is cut off with a diathermy knife, and the third stage consists of restoring the continuity of the bowel either by one of the crushing methods or by suture. While this method is naturally unpleasant for the patient in that it entails two or three operations, it is far the safest, and an unpleasant procedure with a live patient at the end is better than the neatest of operations resulting in a dead one.

The most difficult cases of all to treat surgically are those with a vesico-colic fistula. As a rule a preliminary colostomy is required with spur formation so that no contents pass below the opening. The lower bowel can then be got reasonably clean, and the severity of the cystitis diminished before further operation is undertaken. If the colostomy can be performed just above the area of diverticulitis, it is sometimes of advantage, as the opening can then be resected with the affected area of bowel. At the second operation the bowel is separated from the bladder, and the opening into this organ is pared and inverted. The colon must be treated according to circumstances. Very occasionally the actual perforated diverticulum can be inverted into the bowel, but usually the condition is too advanced for that, and the affected bowel must be resected. If this is a moderately local area and situated not too low down, end-to-end union over a tube may be possible, but in many cases the lower end of the bowel will have to be closed and the patient will have to pay the price of a permanent colostomy for relief from his symptoms.

Such, then, is briefly the treatment we have to offer; and it is evident that much can be done for these patients provided a reasonably early diagnosis is made. Both medical and surgical treatment have

their part to play—a state of affairs which is common to many abdominal and other diseases. We hear far too much about people "believing" in either medical or surgical treatment for any particular condition. The truth is that the good physician will use surgery as freely as any of the other curative methods at his disposal, and the good surgeon, who should be a physician at heart, will not allow pride of craft to influence his judgment.

THE ACTIVATION OF SYPHILIS BY TREATMENT.

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THE object of this communication is to bring together facts which appear to demonstrate conclusively that not only may inadequate treatment by 914 and its allies produce an arsenic-resistant type of spironema, but that treatment, especially insufficient treatment, may actually activate latent syphilis.

It is now 20 years since Ehrlich and Hata announced the discovery of salvarsan. During the optimistic period which inevitably follows the introduction of an intensely advertised addition to the therapeutic armamentarium, a ritual of treatment was evolved and was widely followed. If we may judge from the opinions expressed by leading syphilologists in recent discussions and communications to the medical press, stereotyped routine has given place to a plasticity which indicates a tardy appreciation of accumulated experience It is hardly an exaggeration to say that after 20 years' trial of the modern remedies there is an absence of unanimity as to the best method of treating syphilis. The introduction of bismuth into antisyphilitic therapy by Levaditi and Sazerac in 1920 introduced a new and important factor, and those of us who were brought up in the old tradition are gratified to see that the claims of mercury are again receiving recognition.

Watrin, in an article on arseno-resistance, justly remarks that "whatever be the cause arsenical treatment is not so simple as it appeared to be some years ago." [1] Now, so long ago as 1911, only a year after the debut of salvarsan, McIntosh and Fildes warned us of the possible production of strains of spirochætes "fast to 606," and stated very definitely that "if such strains become general, the therapeutic value of the substance will be much diminished." They pointed out that the survivors of sublethal doses acquire an immunity, and that "in practice . . . . . such strains, if they occur, will be produced by an initial treatment of too slight intensity." [2] The warning of these writers has been amply justified. The conditions they foreshadowed have been completely fulfilled. For a long period it has been the custom to treat syphilis by small doses of the arsenicals repeatedly administered by intravenous injection in one or more courses. The very natural reluctance to give Ehrlich's effective doses to ambulant patients, who are under no control and may not be seen for a week, is an important factor not only in increasing the resistance of the spironema, but in actually stimulating it to activity, as I propose to show shortly.

An examination of recent pronouncements shows that there are extraordinary variations as to what are now deemed to be safe doses of the arsenicals. We also observe that while one authority advises *alternate* courses of 914 and bismuth, another insists on the imperative necessity of the *simultaneous* administration of these remedies, a third recommends an initial course of mercury, followed by arsenicals, then by bismuth, concluding with iodides. Another school would, even in early syphilis, always add pyrotherapy (malarial treatment, &c.), to chemotherapy. This last contention makes it seem possible that, as I have suggested elsewhere, our early dramatic successes with 606 may have been partly due to the pyrexia with rigors caused by our giving the drug in 100 c.cm. of imperfectly sterilised normal saline.

Some of the differences of opinion may perhaps be explained by the impossibility of keeping accurate observation on large numbers of persons treated as out-patients. It is, however, obvious that our 20 years' experience of salvarsan therapy has resulted in agreement upon one point—that it is impossible to rely upon arsenicals alone to effect a cure, if we can still speak of a "cure" of syphilis. No one will, I think, contest the opinion of Warthin [3] that the chief advantage of the arsenobenzols is "the more rapid reduction of the average case to a stage of latency." "This latency," he points out, "may last throughout the individual's life, or at any time exacerbations may take place and the disease arise above the clinical horizon." As a pathologist he remarks upon our ignorance as to whether these renewals of virulence are due to changes in the quality of the spironema or to changes in the resistance of the body. We are in complete ignorance of the state of the microbe in its latent phases, and we know little or nothing of the changes in the reacting power of the body. Milian, from the clinical aspect, appears to give adequate evidence that *one* of the factors which may determine an exacerbation is the direct stimulation of the dormant spironema by antisyphilitic treatment.[4] To such stimulation he gives the name of "biotropism." It is, of course, not suggested that this explanation accounts for more than a part of the exacerbations, but it evidently demands close study. That different doses of drugs produce different effects is common experience and is recognised in elementary therapeutics. It is hardly necessary to recall the stimulant effect of small doses of opium and the sedative influence of larger quantities.

Biotropism is the activation of microbes by chemical and other stimuli. Milian contrasts this process with Ehrlich's parasitotropism and organotropism, which conditions are *necro-tropic*—that is, they tend to the destruction either of the parasite or of the host. Biotropism is met with in many circumstances. I have personally seen a small dose of 914, administered as a gentle tonic, induce an acute attack of subtertian malaria, verified by the demonstration of the plasmodium in the blood, and by its rapid response to quinine. In this instance the patient had no idea that he was subject to malaria. The administration of 914 may stimulate to activity a latent streptococcal infection in the throat, with the result that at the end of nine days a tonsillitis and scarlatiniform erythema develop with pyrexia, the syndrome being indistinguishable from scarlet fever. This phenomenon has occurred more than once in my hospital experience, and it is commonly regarded as evidence of arsenical poisoning. It is obviously not so for it disappears under more intense treatment with arsenic and is quite different from the diffuse moist universal salvarsan dermatitis which only occurs after a *course* of arsenobenzol treatment. Mercury and bismuth, and occasionally arsenic, may stimulate septic organisms in the buccal cavity and thus cause grave stomatitis. Similarly, drugs may activate latent staphylococcal infection, &c., and the stimulation of the dormant viruses of herpes and zona by arsenic and other drugs is familiar. Arsenic, and particularly the trivalent arsenicals, such as 606 and 914, appear to be the commonest biotropic therapeutic agents, but both the other antisyphilitic remedies, mercury and bismuth, are not infrequent offenders.

"Provocative" Injections of the Arsenobenzols.

The simplest example illustrating the theory of the activation of syphilis by treatment is afforded by the commonly used "provocative" injections.

In cases in which the Wassermann reaction has been rendered negative by treatment, a small dose of 914 given after an interval of some months is frequently followed by a positive reaction. The most satisfactory time for this examination is about the fourteenth day after the provocative dose. It is not too much to assume that such positive reactions indicate the activation of groups of spironemata which have been lying dormant. Such a positive reaction may last for some days to some months, and often yields to further treatment by larger doses of the drug. It is also noteworthy that in cases where mercury has rendered a blood reaction negative, the administration of 914 without any interval may activate a focus not touched by the mercury and again give a positive reaction. These observations are commonplace, but they support the thesis.

There is evidence that not only drugs but also infectious diseases may activate a dormant syphilis and produce a positive Wassermann reaction. Milian quotes Neuda's case in which a negative blood reaction in an old syphilitic patient became positive during an influenzal pneumonia, and Marini's case in which typhoid fever brought out a papular syphilide with a positive Wassermann in a patient who was not known to be luetic. It has been suggested that some of the positive reactions occurring in certain acute fevers may be examples of biotropism—viz., the activation of a latent syphilitic infection. "Protein shock" and the vaccines are also known to bring out a positive Wassermann reaction in rare instances.

Conflict Between Drug and Microbe: Jarisch-Herxheimer Reaction.

About 30 years ago Jadassohn and Jarisch described the intensification of a syphilitic roseola under the influence of injections of grey oil. The importance of this observation was not realised until the frequent occurrence of a temporary augmentation of the cutaneous and mucous membrane manifestations of syphilis after treatment by 606 focused attention upon it. Herxheimer's work led to his name being associated with that of Jarisch. These reactions are much more frequent under arsenobenzol therapy than with mercury, and they occur commonly at the beginning of a course—that is, with insufficient treatment.

Milian has shown in a striking manner that bismuth may cause a Herxheimer reaction. He has placed in the museum of the St. Louis moulages representing two gummatous ulcers of the skin before and after the administration of two intramuscular injections of bismuth. One lesion was the size of a franc and the other as big as a two-franc piece. Instead of the ulcers retrogressing under the treatment they doubled in size, becoming at the same time redder and with increased discharge.

No one doubts that such reactions occur in visible cutaneous and mucous membrane lesions, but it does not appear to be so generally realised that the same type of phenomenon occurs in syphilis of the brain and peripheral nerves, in the liver, and in the heart. This is the result of the common failure to appreciate the fact that in the stage of generalisation every organ is invaded by the spironema and reacts more or less characteristically to it. Formerly the Herxheimer reaction was explained by the liberation of endotoxins from the microbes, but it is now recognised that it is evidence of a "therapeutic conflict" between the virus and the drug, and that the drug is insufficient to destroy the organism. Or, as Milian puts it, "it is a stimulation of the germ by a medication which is insufficient either as to dose or as to nature." Such therapeutic conflicts are accompanied by elevation of the temperature, with rigors, sweating, and general malaise, which may simulate malaria, but beyond the occurrence of vomiting and diarrhœa there is no evidence of arsenical intoxication. These reactions may occur without any visible cutaneous or mucous membrane manifestation.

The series of charts in "Le Biotropisme" recall reactions familiar to those who have had the opportunity of following cases under treatment in the wards of a hospital. In the simplest and commonest there is only one rise of temperature, perhaps to 102° or 103°, after the *first* dose of 914. In other cases a similar rise follows each *increase* in the dose. In some instances the temperature remains elevated with doses of 0·3 g. to 0·6 g., but after a profound reaction to one or more doses of 0·9 g. there is no further pyrexia. One striking chart shows intense reactions (T. 104°–105°) to doses of 0·3 g., and the production of a continued syphilitic pyrexia which was completely abolished by intramuscular injections of bismuth. The continued fever having been eliminated by bismuth it was possible to resume arsenical treatment without untoward symptoms. Another equally important chart shows repeated high temperatures (104°, 105°) after doses of 0·3 g. of 914, which were entirely absent with daily injections of cyanide of mercury (0·01 g.), whereby the resumption of treatment by 914 up to doses of 0·9 g. became possible. These observations show that in certain cases bismuth and mercury have a more powerful effect than arsenic, and demonstrate the great value of careful thermometric observations which unfortunately are impossible in an out-patient clinic.

Jaundice, Syphilitic or Toxic?

Warthin [3] tells us that the occurrence of a mild degree of atrophic hepatitis is very common in latent syphilis. The percentage of cases in his material in which the liver is involved appears to be on the increase, particularly in those given a modern treatment with arsenic. There may be no symptoms; for so large an organ as the liver may still retain a sufficiency of healthy tissue to carry on its functions. On the other hand, there is no doubt that arsenic itself may damage the liver, and such toxic action has long been a source of anxiety to all engaged in the modern treatment of syphilis. There are, therefore, two distinct types of jaundice, the more common syphilitic, the rare toxic, and it may be very difficult to distinguish them.

In a recent communication Schamberg [5] states that seven fatal cases of acute yellow atrophy occurred in one clinic during the past year, and states that such fatalities can only be avoided by small doses of the drug, the maximum for 914 being 0·6 g. Harrison,[6] at the Medical Society in February last, is reported as saying "For *syphilis affecting the liver* arsenobenzol compounds were contra-indicated." (The italics are mine.—J. H. S.) On the other hand, Milian holds that 90 per cent. of the cases of jaundice which occur during antisyphilitic treatment are merely the awakening of a dormant syphilitic hepatitis and as such require intensive treatment. He cites the following case which appears to be incontestable:—

In consultation with Dr. Ravaut he saw a patient with secondary syphilis, in whom a well-marked jaundice had appeared during treatment with 914, a dose of 0·75 g. having been reached. In view of the jaundice, Dr. Ravaut had decreased the dose to 0·15 g., followed by 0·3 g. In spite of this reduction the icterus increased. The case is described as one of typical afebrile obstructive jaundice, with decolorisation of the stools, &c., but with no evidence of arsenical intoxication. On Milian's advice doses of 0·9 g. and 1·05 g. were given, diuresis was established, and the jaundice rapidly disappeared. He maintains that this was a case of syphilitic hepatitis aggravated by small doses of 914, but which yielded at once to more intensive treatment.

In this connexion it is interesting to mention that Lafoucade, J. Fouguet, and Nativelle [7] report 23 cases of jaundice occuring during antisyphilitic treatment, of which only five were actually under arsenobenzol, the remainder being under mercury or bismuth, and none of them had recently had arsenical treatment. They therefore conclude that jaundice is not more frequent under arsenic than under mercury or bismuth (a conclusion not confirmed by my own experience). The sequel is important, as it strongly supports Milian's thesis. Thirteen of these cases had developed jaundice while having injections of grey oil. They each received a course

of arsenobenzol, and the icterus disappeared in every case, usually after the second or third dose.

It is obvious that very few clinicians would feel justified in following the admirable example of these observers, and the matter can hardly be further advanced until we have some reliable means of determining the relationship between indifferent excretion and toxic manifestations. Some work of N. L. Lloyd at Guy's Hospital [8] tend to show that Abelin's reaction, which can be applied in out-patient practice, may prove of assistance in this respect. In any case the subject demands carefully controlled investigation.

Cardiovascular Syphilis: "Heart-block."

That syphilis is an important cause of disease of the heart and vessels is well recognised, and there seems to be little doubt that these affections are on the increase. It has been suggested that modern arsenical treatment alters the life-history of the spironema in the body (Sarbo[9]). Langer's report states that while there was disease of the aorta in 33 per cent. of syphilitics seen in the post-mortem room in 1907 (that is before salvarsan), the percentage had risen to 63 per cent. in 1915 and 83 per cent. in 1925.[10] These figures are supported by records from other pathologists. It may be argued that there is more care taken in investigating these cases, and that the technique has greatly improved, but my own experience, which I feel sure will be confirmed by others, is that as far back as 1907 pathologists of repute were fully alive to the occurrence of syphilitic endarteritis, &c., and the improvement in histological technique cannot account for the remarkable figures quoted above.

In addition to disease of the vessels and cardiac valves there is increasing evidence that the myocardium is frequently involved. Such involvement may be without symptoms, but tachycardia and arrhythmia are common and "heart-block" occasionally occurs. It is now evident that cardiovascular syphilis is responsible for more deaths than general paralysis and tabes.[11] Myocarditis may be primary or secondary to endarteritis of the coronaries. "Heart-block" may be caused by disease of the vessels supplying the bundle of His, or by actual gumma or fibrosis in that region. It is said that the trivalent arsenicals have caused "heart-block" in patients free from the condition, and it is suggested that these drugs act directly on the bundle of His. It, however, seems much more reasonable to explain the phenomenon as being caused by the arsenic stimulating dormant spironemata in the involved area. It is stated that neither the pentavalent arsenicals nor bismuth produce this effect upon the heart.

Renal Conditions.

It is now understood in clinics that simple albuminuria, often of syphilitic origin, is no contra-indication to treatment. The albuminuria usually clears up. In grave arsenical intoxication suppression of urine may occur, and Milian has published a case of grave anuria during mercurial treatment. He believed this to be due to septic absorption from a severe stomatitis.

Nervous Affections: Neurorecurrences.

In the early days of salvarsan treatment it was noticed that symptoms of the affection of cranial nerves and of the central nervous system sometimes occurred after treatment by injection. These recurrences were certainly more frequent than under mercurial medication. Auditory and facial nerve paralyses were the commonest but the oculomotor nerves were also affected. I put on record cases of paraplegia, and have seen hemiplegia. It was soon established that these neurorecurrences were more frequent in patients who had been insufficiently treated by arsenic, and that they usually cleared up with further injections of the remedy.

Some of Milian's cases strongly support this view, and one is so instructive that I may be pardoned by giving a brief précis of the details.

A woman aged 35, the daughter of a general paralytic, suffered intensely from migrane which prostrated her for 24 to 48 hours at frequent intervals. Although her general health was otherwise very good, her doctor suspected the syphilitic origin of these headaches, and gave her a dozen intravenous injections of cyanide of mercury. The result was almost magical, and the migrane did not recur. The patient went for a holiday and treatment was suspended. On her being seen three months later, she was found to be suffering from grave hemiplegia with aphasia, which has since gone on to contracture. There appeared to be no doubt that the treatment had determined the more grave affection, and the medical man regretted his interference. In his comment on this case Milian insists that it is not the treatment but the insufficiency of the treatment which should be blamed. Not only was treatment stopped too soon but the patient was allowed to go away far from medical advice without even being ordered mercury by the mouth.

A case of paraplegia occurring in a young man during a moderate course of treatment is also detailed. In this instance the paraplegia seems to have been determined by a chill. It was complete, with retention of urine and incontinence of fæces. Here an intensive treatment by arsenicals and mercury cyanide in combination was followed by intravenous injections of arsenobismuth. The patient was completely cured of his paralysis in six months.

The author points out the importance of studying the methods of treatment which have been employed before the outbreak of fresh symptoms. An indication will often be thus obtained as to the advisability of increasing the dosage of the previously used drugs or what is often better, *to change the antisyphilitic medication* (the italics are Dr. Milian's.—J. H. S.).

Conclusions.

The absolute cure of syphilis—i.e., the complete destruction of all the spironemata in the body—is rare. The value of the arsenobenzols lies in their rendering an active syphilis latent more rapidly than any other form of medication. Ehrlich's therapeutic doses—0·015 g. per kg. of body-weight for the neosalvarsan group (914), and 0·01 g. per kg. for the salvarsan series (606), are usually quite safe; the parasitotropic and organotropic properties are in the approved ratio. The intravenous injection of these powerful drugs in *adequate* doses demands great care, and the proper preparation and competent observation of the patient—preferably in hospital. In a national scheme of treatment these ideal conditions, even if provided by private munificence, have to be surrendered to make the clinic attractive to, and wait upon the convenience of, a proletarian clientèle. Ambulant patients, who are only seen once a week and rarely, if ever, make the acquaintance of the clinical thermometer, must be given smaller doses and the less active preparations.

This sacrifice of efficiency to expediency has led to the evolution of strains of arsenic-fast spironemata and is attended with the risk of activating latent foci of infection. These risks may be modified, if they cannot be removed, by polytherapy—mercury, bismuth, and iodides being included with arsenicals in routine treatment.

Some of the early reactions hitherto thought to be evidence of intolerance to the drugs are merely activation of latent microbic (coccal, &c.) infections—e.g., the scarlatiniform, morbilliform, and other erythemata, or the stimulation of dormant viruses, such as herpes and zona. These all clear up with more active treatment. The most serious results of arsenical intoxication are salvarsan dermatitis and hepatitis. Neither are common. The dermatitis only occurs after a *course* of injections. Jaundice in the majority of cases is not an evidence of toxæmia due to arsenic, but is produced by the stimulation of a latent syphilitic hepatitis by inadequate treatment. The difficulty in distinguishing this has been discussed.

There is no question of the activation of latent syphilis by drugs, and this danger is greatest when the trivalent arsenicals are used, particularly in small doses. I entirely agree with Milian that *it is better to leave these cases alone* though they have a positive

Wassermann, *than to submit them to inadequate treatment.* By any combination of remedies we are not likely to eliminate infections of the nervous system, nor are we likely to approach the figures of Bruusgaard,[12] who found only 0·6 per cent. of general paralysis in untreated cases, whereas the usual figure in treated patients is 4 per cent.

To diminish the risks of infection we must probably continue to treat all syphilis in the active stage, but in later cases it seems reasonable to ask whether we should not pay more attention to the condition of the patient than to his Wassermann reaction.

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CLASSIFICATION OF FOUR THOUSAND EXPERIMENTAL OIL AND TAR SKIN TUMOURS OF MICE.

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THE tumours under consideration were produced in mice by the frequent application of pure and chemically treated carcinogenic agents having different degrees of potency. The number of benign and malignant tumours which have resulted from our experiments are :—

—	Animals utilised.	Benign.	Malignant.
Coal gas tars	800	93	106
Synthetic tars	8,800	1,086	1,281
Shale oils	10,000	977	307
Petroleum oils	6,100	183	43
Other oils, &c.	500	0	0
Pure compounds ..	2,900	15	6
Totals	29,100	2,354	1,743

About 8000 animals, of which approximately 1000 are bearing or have borne tumours, belong to incomplete experiments and are not included in the above totals, but the tumours of approximately 500 of these animals which have died have been examined microscopically and utilised for classification purposes.

The pre-tumour or pre-cancerous stage of the epithelium we do not propose to discuss here. The only observation we wish to make is that the more specimens we examine the more are we convinced that the gap between the benign and malignant is bridged by innumerable transitional cells. A single really good specimen will reveal a picture of a series of cells which would seem to have reached different stages in the development from the benign to the malignant, while many widely separated groups of cells may have simultaneously reached an equal degree of malignancy.

The tumours which we have met with can be divided into :—

(A) Tumours of the surface epithelium,
(B) „ „ „ follicular epithelium,
(C) „ „ „ sebaceous glands
(D) „ „ „ connective tissue, and
(E) „ comprised of mast cells.

In the first place the tumours are divided into benign and malignant. The classification of a tumour is, of course, not always easy. In difficult cases serial sections will sometimes permit one to make a definite diagnosis, but this procedure may fail to help, and in the latter case personal factors decide into which group a particular tumour shall fall. We have not deemed it necessary to institute an intermediary group of doubtful tumours because in the calculation of the carcinogenic potency of our agents due allowance is made for this contingency. Each group will now be briefly discussed, and in order to avoid repetition groups A and B will be considered together.

(*A*) *and* (*B*) *Tumours of the Surface and Follicular Epithelium.*

Benign tumours may be divided into: (1) tiny thickened areas of the epithelium which produce a small mound, just visible to the naked eye, on the otherwise smooth skin; (2) flat warts; and (3) papillomata, by far the commonest variety of benign tumour met with. The small foci of acanthotic epithelium which constitute the thickened areas of epithelium referred to in sub-group 1 we do not classify as true tumours on account of the tendency for regression of the epithelium to take place and leave again a smooth clean skin.

Malignant tumours.—These may be classified as follows :—

1. Spino-cellular, normal.
2. „ with cystic tendency.
3. „ „ scirrhous „
4. „ „ hyaline „
5. „ „ basal-celled „
6. „ „ medullary „

Medullary tumours may be: spindle-celled, endothelial-celled, or alveolar, and if in these tumours keratinisation is not obviously present we classify as pure spindle-celled, &c. If two different areas of a tumour have each different histological features the tumour is classified as "mixed." If two such histological features are present in a single small area the tumour is called "intermixed." If two or more primary tumours occur in a single animal the ordinary term "multiple" is used. Multiple tumours may be of one or more than one variety, and both benign and malignant tumours may be present on the same animal.

A few details will now be given with reference to several of the more interesting examples of this group of tumours. In the first place it is to be noted that what we call flat warts are very often the result of hyperplasia of the follicular epithelium. If the surface epithelium is sufficiently hyperplastic to give the appearances of a flat wart the microscope usually shows that the tumour is already malignant. The majority of experimental malignant tumours of the surface and follicular epithelium are of the ordinary spino-cellular variety, and they are classified as normal spino-cellular epitheliomata. It is only when special histological features are present to a marked degree that the tumour is classified as spino-cellular with cystic, basal-celled, spindle-celled, &c., tendency. If there is little indication of any relation to the spino-cellular type the tumour is classified as pure cystic, basal-celled, spindle-celled, &c. New growths of follicular origin seem to have a greater tendency to become cystic than those originating from the surface epithelium, while medullary tumours do not often appear to originate from the follicles. Nothing further need be said concerning cystic, scirrhus (Fig. 1*), or hyaline tumours (Fig. 2), except in so

* The photographs are by R. Combes, Manchester University.

far as they are related to basal-celled and medullary tumours, the last two varieties, however, requiring a more detailed description.

Among our tumours it would appear that some at least have their origin from the basal layer of cells, although in no instance have we seen a tumour which could be classified as what is called a basal-celled epithelioma. We have frequently observed in the early stages of epitheliomatous disease of mice that the processes of cells penetrating into the dermis are in appearance identical with the cylindrical or somewhat cubical cells typical of a basal-celled epithelioma (Fig. 3). This condition is, of course, not peculiar to mice. The inward growing, densely cellular, irregularily edged, papillomatous processes, although bearing a resemblance to a basal-celled tumour, in all cases appear ultimately to become differentiated into the spino-cellular type of tumour. It has been suggested that these tumours might be classified as mixed basal-celled spino-cellular, but we prefer to consider them as spino-cellular tumours with a tendency to the basal-celled type.

The most prevalent variety of pure medullary tumours is the non-keratinising, small spindle-celled epithelioma, which has occurred in about 2 per cent. of our experimental skin tumours. If mixed and intermixed spindle-cell tumours are included the percentage is about 10. The large spindle-celled tumour is not so frequently met with. A typical spindle-celled epithelioma is very cellular, and consists of bundles of interlacing smallish spindle cells which in a single section may be cut in all directions (Fig. 4). The deep margin of the tumour is usually fairly well defined (Fig. 4) although it may be infiltrative (Fig. 5). Laterally, however, the tumour tends to spread far beneath the sound epithelium, and finally it blends imperceptibly with the subcutaneous connective tissues so that it is impossible to define the limits of malignancy. In a typical specimen the tumour cells approach right against the basal cells of the laterally intact surface epithelium. The fading away, so to speak, of the infiltrative edge of the malignant growth is of interest in relation to the lack of spindle-cell metastases. In what we call the pure spindle-celled tumours the absence of the so-called cell nests is a special feature, but a careful study will at times reveal commencing keratinisation of some of the cells. In the mixed and intermixed tumours keratinisation is, of course, part of the microscopical picture.

It is a significant fact that in almost every instance where we have found a pure spindle-celled tumour it has been situated on the edges of a fibrosed sore or has a frankly ulcerated surface. The tumours may by provided with thin-walled vessels which, together with hæmorrhages, are most numerous on the periphery. As the microphotographs show, the tumours are superficially not dissimilar to sarcomata, but that they have really originated from epithelial tissue is not usually difficult to demonstrate. Sometimes the spindle cells can be seen flaking as it were from the basal layer of cells (Figs. 6 and 7), and would thus appear to have their origin from the basal epithelium. This condition of affairs is, however, the exception.

Another special variety of the medullary tumour is the alveolar epithelioma (Fig. 8), wherein the tumour cells are divided into islets by strands of connective tissue.

The endothelial-celled tumour is the third variety of medullary epithelioma and like the alveolar tumour is only occasionally met with. While in the spindle-celled tumour the malignant cells blend and become indistinguishable from fibroblasts, so in the endothelial variety the malignant cells may become lost among the normal endothelial cells. It seems to us that both alveolar and endothelial varieties of malignant growth may be a stage in the metaplasia of the prickle cell to the resistant spindle cell, but in the majority of cases the metaplasia is direct.

With the onset of ulceration and concomitant sepsis complete healing of malignant tumours may take place, but total destruction of the tumour appears never to occur in the absence of ulceration. We have failed to observe regression of a tumour the surface epithelium of which was intact, but before the malignant growth is visible to the naked eye the microscope provides evidence that in some animals tiny primary foci of malignant cells may keratinise completely, no living cells remaining, so that in such cases the nucleus of a tumour would appear to be destroyed before any advance in growth is able to take place.

With the advent of ulceration and the entrance of bacteria a spino-cellular tumour may heal completely or it may heal in the centre and continue to grow at the edges. The malignant cell, however, would appear sometimes to adopt a special procedure in order to ensure survival—viz., it ceases to keratinise. When dealing with spindle-cell tumours one is struck by the absence of deep sepsis and necrosis of tissue, the dense wall of interlacing cells seemingly forming an impermeable barrier to the surface infective micro-organisms. Thus one is led to believe that the change to the spindle cell is a necessary consequence of the inability of the prickle cell to withstand sepsis; if metaplasia does not take place then that particular focus of malignant cells is liable to be totally destroyed. It is also probable that sepsis is the primary factor in causing the tumour to change from a keratinising to any of the varieties of medullary tumours, the relatively healthy undifferentiated cell offering a more effective resistance to bacteria than the keratinising (degenerating) highly differentiated cell. Consequently, central healing of an ulcerated medullary tumour is not commonly seen.

We have come to the conclusion that the change in morphology of the cells is often due to the influence of neighbouring cells, a fundamental biological phenomenon. Thus it would appear that when a spino-cellular tumour under the influence of sepsis changes its method of growth to that of spindle cells, the latter as they spread from the central ulcer beneath the intact surface epithelium cause this epithelium also to proliferate directly as spindle cells and not as squamous cells (Fig. 7). Also, we have seen that the malignant spindle cells as they infiltrate the connective tissue may gradually lose their morphological characteristics and become microscopically indistinguishable from fibrous tissue cells, but the significance of this phenomenon we are not at present prepared to discuss.

It has been mentioned that our tumours are rarely pure and on the contrary often possess several of the features described. For instance, we classify a tumour as a pure spino-cellular or a pure spindle-celled, while we have mixed spindle-spino-cellular and intermixed spindle-spino-cellular (Fig. 9), &c. An intermixed tumour of the kind referred to is really a spindle-celled tumour with definite areas of keratinisation, or if one prefers to look at the subject from another angle it is a spino-cellular tumour which, under the influence of some physico-chemical stimulation (sepsis), grows as a spindle-celled tumour.

It is to be noted that metastases which we have found in lymphatic glands, lungs, and once only in the kidney, have all been of the ordinary spino-cellular type. A tiny metastasis in the kidney is shown in Fig. 10, but there were also several larger ones in the same organ.

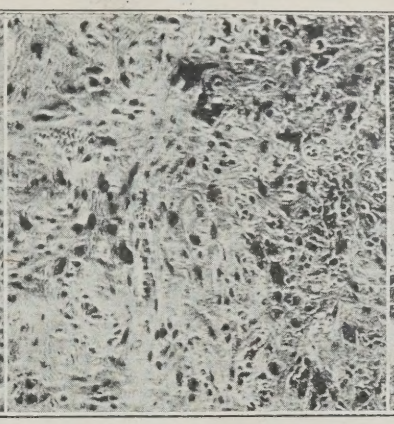
Of some interest was the simultaneous occurrence in an animal of an experimental mixed spindle-spino-cellular epithelioma and a breast spontaneous cystic adenocarcinoma. We consider it fairly safe to assume that the latter was a spontaneous tumour, although we have observed that female mice suffering from experimental epitheliomatous disease may on occasions show definite evidence of mastitis.

In Fig. 11 the spindle cell portion of the epithelioma is seen to be invading the cystic breast, which latter was elsewhere definitely carcinomatous. It was difficult to estimate which of the two tumours would ultimately have survived had the animal lived, although on the whole the

1

Spino-cellular epithelioma with scirrhous tendency. (× 185.)

2



Epithelioma. Hyalinisation. (× 110.)

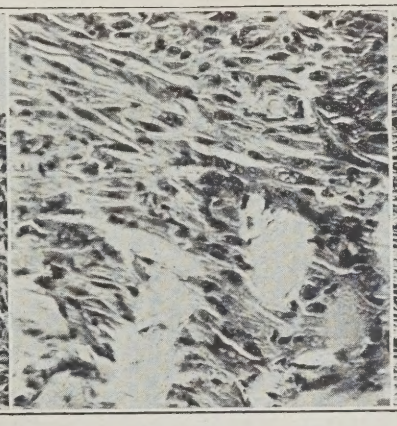
3

Spino-cellular epithelioma with basal-celled tendency. (× 110.)

4

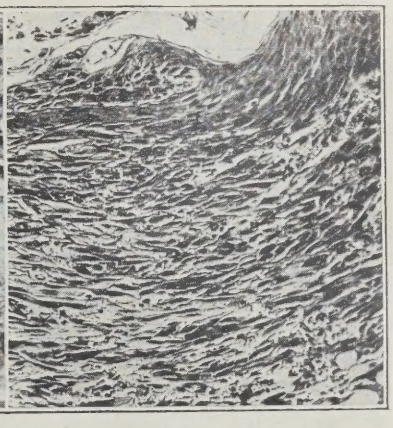
A pure spindle-celled epithelioma, showing interlacing bundles of malignant cells cut in different directions. Also shows well-defined deep margin. (× 180.)

5



Spindle-celled epithelioma invading muscle. (× 310.)

6



A spindle-celled epithelioma, showing flaking from basal layer of intact epithelium on edge of ulcer. (× 110.)

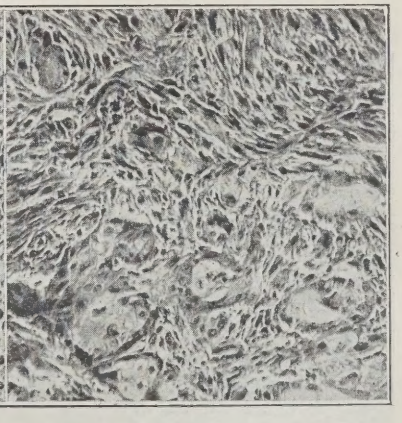
7

A spindle-celled epithelioma spreading beneath intact epithelium which is in turn proliferating directly as a spindle-celled growth. (× 110.)

8

Alveolar arrangement of cells of a medullary epithelioma. (× 110.)

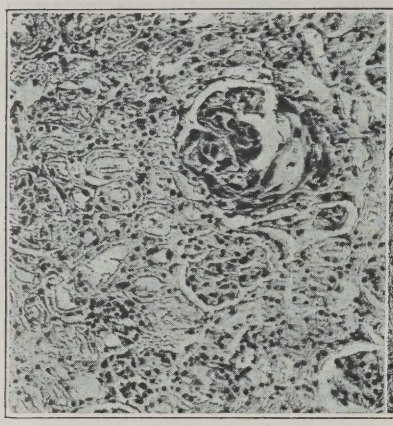
9



Intermixed spindle spino-cellular epithelioma. (× 110.)

EXPERIMENTAL OIL AND TAR SKIN TUMOURS OF MICE.

10



Epithelioma metastasis in kidney (very exceptional). (× 110.)

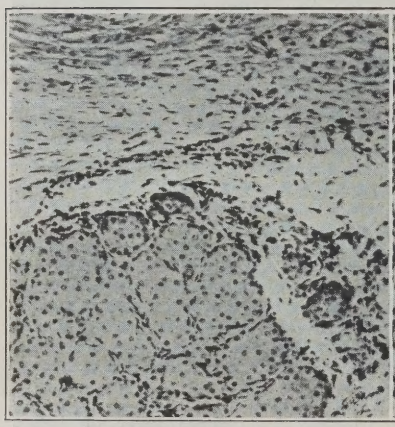
11

Invasion of spontaneous breast adeno-carcinoma by spindle-celled epithelioma. (× 19·5.)

12

Portion of a cystic sebaceous adenoma. (× 120.)

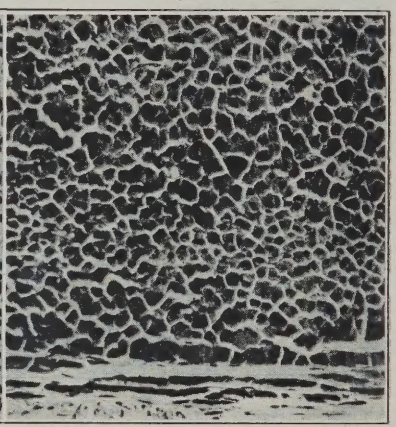
14



Portion of a sebaceous adenoma. (× 120.)

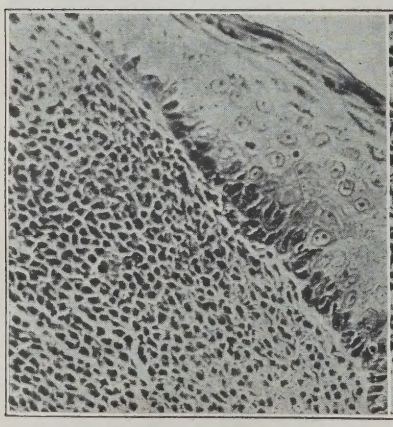
Round-celled sarcoma type tumour, probably not of epithelial origin, induced by the skin application of shale oil. (× 350.)

15



Normal mast cell tumour of skin. (× 110.)

16

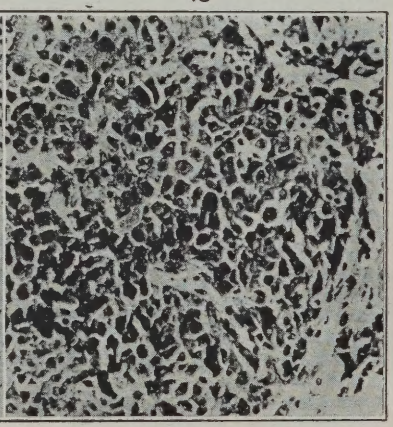


Modified mast cell tumour of skin. (× 350.)

17

Mast cell replacement of normal splenic tissue. (× 350.)

18



Mast cell infiltration of liver. (×350.)

EXPERIMENTAL OIL AND TAR SKIN TUMOURS OF MICE.

microscopic evidence was in favour of the epithelioma-tous spindle cells being in the process of destroying the breast carcinoma.

C. Tumours of the Sebaceous Glands.

Benign tumours only have been encountered. They are divided into: (1) sebaceous cysts, and (2) sebaceous adenomata. It is unusual for a tumour to be pure in type, a tumour of the sebaceous cells being generally a cystic adenoma. A cystic adenoma and a pure adenoma are shown in Figs. 12 and 13. As gas tars and synthetic tars tend to cause sebaceous cell atrophy tumours of this group are rarely seen in animals painted with such materials. Certain other agents appear to induce a sebaceous cell hyperplasia and occasionally definite tumours may subsequently arise. Medicinal liquid paraffin and oleic acid are examples of such agents, their action being apparently increased by the addition of certain insoluble aromatic hydrocarbons. As we do not consider that the development of a sebaceous adenoma is induced by the carcinogenic principle in our agents these tumours are excluded from our calculation of carcinogenic potency. However, we have only met with about 20 specimens up to the present time.

D. Tumours of Connective Tissue Origin.

No benign and only one malignant tumour of this group occurred among our animals. In this particular case there was no evidence that the tumour concerned was of epithelial origin, although it may have so originated. Microscopically it resembled a round-celled sarcoma. The history of the case was as follows:

Mouse 17719 was painted twice a week with a synthetic tar which had been treated by bubbling through oxygen at a temperature of 150–160° C. A wart developed during the 14th week of the experiment which later fell off and left an ulcerated surface. During the 28th week a small hard lump was palpable which was diagnosed as an epithelioma, and the animal died during the following week. A microphotograph of the tumour is shown in Fig. 14.

E. Tumours Composed of Mast Cells.

The invasion of the subcutaneous tissues and the corium by mast cells is a notable feature in the skin of animals painted with carcinogenic agents, but more so in the case of tars than in the case of oils. The extent of the invasion is usually roughly proportional to the amount of subepithelial inflammation present. Aggregation of these cells may give rise to definite tumours which may be visible to the naked eye and simulate small flat warts (Fig. 15). There is often a tendency for the cells to lose their basophile granules and to become smaller in size with a clearly defined nucleus, and when such changes are exaggerated they take on the appearance somewhat resembling a nævus cell. As in nævi the tumours may be situated directly beneath the epithelium (Fig. 16).

All such tumours appeared to be benign, but it is interesting to note that a diffuse infiltrative condition of the internal organs seemed to have been the cause of death of one of our animals:

Mouse 21079 was treated with bi-weekly applications of a 10 per cent. solution of synthetic tar B/10 in oleic acid and during the 14th week of the experiment developed a wart which showed evidence of malignancy within four days. The animal died eight days later, the malignant tumour having ulcerated. On post-mortem examination the spleen was found to be large and swollen with the normal tissue replaced by nodules of growth of a greyish appearance. The liver was slightly large and anæmic but showed no definite nodular new growth formation.

Microscopically the skin showed a small epithelioma which was evidently being rapidly destroyed by sepsis. In the subcutaneous tissues was a small mast cell tumour. The spleen showed a central mass of tumour with two lateral areas of blood which contained lysed patches of tumour cells. In the margin were remnants of comparatively normal splenic tissue. The tumour edge was, on the whole, sharply defined from the hæmorrhagic tissue. The individual tumour cells, where isolated, were round cells about 20 μ in diameter, and with a well-defined roundish nucleus 6–8 μ in diameter. Stained with hæmatoxylin the cells were packed with the granules and were identical in appearance to the modified mast cells so frequently found as a tumour in the subcutaneous tissues of mice painted with tar (Fig. 17). A noteworthy feature of the splenic tumour cells was that many of them were full of red blood corpuscles. The cells where crowded together were more irregular in shape and size. No definite mitoses were observed in the tumour cells. In the liver microscopic nodules of tumour cells were present and there were isolated cells infiltrating the liver parenchyma (Fig. 18). The cells were similar in appearance to those found in the spleen, but no intracellular blood-cells were seen.

Transmission of the condition to other mice was not attempted. Had such transmissions been tried we do not think for several reasons that we should have had any positive results.

THE EFFECT OF RIVANOL IN THE TREATMENT OF AMŒBIC DYSENTERY.

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AND
DR. M. A. ARAFA,
MEDICAL REGISTRAR OF THE HOSPITAL.

RIVANOL (ethoxy-diamino-acridine-lactate) is a yellow dye-stuff with a powerful antiseptic action. It has been used as a local antiseptic in various septic skin conditions and in genito-urinary and other infections. More recently its employment in dysenteries and allied conditions of the lower gut has been advocated. Urchs[1] obtained good results in the treatment of tropical colitis by the use of rivanol solution injected rectally, and considered the benefit derived to be due largely to its antiseptic action on the superadded secondary infection. Peter[2] carried out further investigations with the drug, using the rectal route of medication in cases of colitis definitely proved to be due to infection with *Entamœba histolytica*. He observed rapid improvement in the general condition of these patients in two or three days, and the bowel symptoms also rapidly subsided, tenesmus being the first to disappear, usually by the second day. The frequency of the stools was not, he found, much influenced until after the second day, but after an average of five days' treatment usually only two or three formed stools were passed daily. Blood began to diminish by the second day and had entirely disappeared two days later; mucus was found to persist a day or two longer than the blood. A further beneficial effect was observed by him during treatment—namely, the disappearance of the tenderness and contraction of the large gut; this was usually completely relieved by the sixth or eighth day—the usual duration of the ordinary course of treatment. The microscopic findings confirmed the clinical observations, the vegetative forms of *E. histolytica* vanishing after the five days of treatment; they were never found when mucus had disappeared from the stools, and cysts behaved in a similar fashion. Provocative medicines were administered before the patients were discharged and repeated stool examinations carried out with negative results. No special diet was found necessary during the treatment, and at the beginning milk was usually given, the diet being increased as symptoms subsided. The average stay in hospital from the commencement of treatment was ten days. The concentration of the rivanol solution recommended was 1:10,000, this being found the most efficacious and the least irritating to the intestines.

The technique of rivanol administration is described by Urchs.[3] A preliminary cleansing enema being first given, 500–800 c.cm. of rivanol solution are run in slowly at body temperature and retained as long as possible, for at least 15 minutes. Peter considered the rectal method unsuitable in certain

cases with high bowel infection, and therefore commenced the oral method of medication, and gives a description of 34 cases so treated.[4] He found that on an average the patients so treated were amœbæ-free after four days, or at least no amœbæ could be found in the stools after this period, even with provocative medication followed by repeated daily examinations of the stools. The usual total amount necessary for cure in adults was found to be 0·843 g. of rivanol. Apart from the lethal action on the entamœbæ, a marked antispasmodic and anæsthetic property was observed, even more so than when the drug had been administered per rectum. Tenesmus soon disappeared, stools returned to normal, and all abdominal and colon tenderness subsided. The course of treatment recommended was to commence as soon as the diagnosis had been confirmed by giving a dose of Carlsbad salts; this was to be followed by 0·03–0·05 g. of rivanol every two hours until the second day, after which this dose was given three times a day for six to eight days. If, clinically and microscopically, marked improvement set in early this dose could be reduced; on the other hand, where diarrhœa and tenesmus persisted to the second or third day of treatment extra dosage was recommended. The highest dose used by Peter was 0·2 g., no ill-effect being observed. In chronic obstinate cases a second course for the sake of certainty was advised after an interval of a week. In a further communication[5] Peter describes the results of treatment in cases of enteritis and enterocolitis in which no definite causative agent could be discovered, the result in these cases being usually satisfactory, even in various diarrhœas of infants.

Experimental work on rivanol was undertaken by Wagner[6] in order to ascertain whether the drug attacked and destroyed *E. histolytica* or whether it merely exercised a restraining influence on the secondary infections caused by the accompanying micro-organisms. Observations were accordingly made both in vitro and in living animals. In vitro, rivanol proved to be the strongest direct amœbicide, a solution of 1:100 causing death of the amœbæ in 24 hours; in dilutions of 1:2000 the action began to fail. Yatren and emetine had to be used in strengths ten times that of rivanol in order to destroy the amœba in culture. In living animals (infected cats where the infection follows a very acute and serious course) the results agreed with those in vitro, a solution of 1:1000–1:1250 alleviating the course of the disease and in some cases completely healing the bowel infection. He considered the action to be a direct lethal one on the amœbæ.

Schaumann[7] demonstrated experimentally the spasmolytic action of rivanol, the colon of the living rat being found most suitable for this purpose. In order to observe the mode of action of the drug, pilocarpine (a nerve stimulant) and barium (chiefly a muscle stimulant) were used, the resultant spasm being relieved by rivanol and papaverine, and the results compared. Finally, experiments were carried out on the hypertonic bowel of rabbits suffering from advanced tuberculosis. He found the action of rivanol to be quite as strong as that of papaverine, the most effective dilution being 1:100,000. Rivanol in dilute solution was found to have a neutralising effect in the spastic hyperexcitability of the bowel, this action being due to an inhibitory effect on the sympathetic nerves. In large doses rivanol was shown to have, in addition to this action through the sympathetic nerves, a direct paralysing action on the bowel muscle, similar to the action of papaverine. He administered the drug to cats in doses of 5 mg. per kg. of body-weight per day during a period of four weeks without any ill-effect, thus showing that the oral route is apparently a safe method of administration.

Recently Weitzmann[8] has reported the use of the drug in four cases of amœbic dysentery, oral administration being employed in doses of 0·05 g. four times in the 24 hours for a period of six days. At the end of the six days' treatment the number of stools was found not to have diminished and the vegetative forms were still present and actively motile. He concludes from his series of cases that the brilliant results obtained by Wagner, Schaumann, and Peter in the treatment of dysenteries had not been confirmed.

Manson-Bahr[9] considers that rivanol injected per rectum in a strength of 1:2000 may produce results similar to those obtained by yatren, and recommends that ten or more such injections should be made in order to obtain satisfactory results.

Results Controlled by Sigmoidoscopy.

Investigations have been carried out by us in a series of cases of amœbic dysentery of different degrees of severity, the diagnosis in each case being confirmed by the finding of actively motile *E. histolytica* either in the discharge from the intestine examined fresh in the ward and in the laboratory or through the sigmoidoscope by means of Volkmann's spoon, scrapings being thus obtained direct from the base of the amœbic ulcers. In two of the cases (Nos. 1 and 12) where repeated examination of the fresh stool had failed to demonstrate the entamœbæ, typical ulcers were seen through the sigmoidoscope, and scrapings produced numerous actively motile entamœbæ, emphasising the importance of this method of investigation in arriving at a correct diagnosis in cases complaining of symptoms of dysentery. Careful note was also made of the appearance of the ulcers through the sigmoidoscope before treatment was commenced, and weekly or more frequent examinations by this method were carried out during the course of treatment, so as to observe visually the effect of rivanol on the bowel lesions. The stools were also inspected daily in the bed-pan, the time of disappearance of the mucus and blood being noted, and the length of time taken for the diarrhœa and tenesmus to subside observed. During treatment the patients were kept on milk diet until symptoms had subsided, after which the diet was gradually increased. The patients were all male.

Résumé of Cases.

CASE 1, a man from Kaliub, aged 23, complained of diarrhœa four times daily with blood, mucus, and tenesmus of three years' duration with sudden onset. The stools were negative for amœbæ by microscopic examination, but found positive in material obtained by spoon-scrape through the sigmoidoscope, which demonstrated small depressed amœbic ulcerations. This patient was put on rivanol, one capsule (0·025 g.), three times daily for 17 days, but although the stools became normal in appearance after a few days on rivanol, yet on the thirteenth day of treatment the sigmoidoscopic picture showed the same amœbic ulcers and a spoon-scrape was still able to demonstrate the presence of living amœbæ. Three days after stopping rivanol the sigmoidoscopic picture of the gut had improved, the ulcers gradually diminishing in size, so that after three weeks they could no longer be seen. Entamœbæ could not now be demonstrated either by the scrapings through the sigmoidoscope or by microscopic examination of the stools, but we were not satisfied that the case was cured, as there were still areas of hyperæmia in the gut, and also much sticky mucus. The patient was discharged, but on reporting again after two months he was found to be suffering from symptoms of dysentery. The sigmoidoscope now showed typical amœbic ulcers and the stools contained living amœbæ. He was put on a course of yatren treatment.

CASE 2, aged 60, was admitted to hospital complaining of diarrhœa, tenesmus, and loose yellowish stools with blood and mucus of four days' duration, the disease starting suddenly. Living *E. histolytica* were detected in the stools. The sigmoidoscope showed much mucus sticking to the bowel wall; underneath it were patches of normal mucous membrane, separating large depressed ulcerated areas. Scrapings contained living amœbæ. The patient was put on rivanol, one capsule (0·025 g.) three times daily, for a week. On the fourth day of treatment tenesmus disappeared and blood and mucus became scanty from the third day. The sigmoidoscopic picture after a week's treatment showed a slightly cleaner appearance of the ulcers. Rivanol was then increased to two capsules three times daily for a week, after which further slight improvement had occurred in the sigmoidoscopic appearance. Amœbæ disappeared from the stools on the tenth day of treatment; blood and mucus had disappeared by the end of the second week. Rivanol was given for a third week in increased dose—i.e., three capsules thrice daily—and during this week the stools continued to be

quite normal in appearance with no amœbæ, even on scraping through the sigmoidoscope. On the completion of this intensive three weeks' course of rivanol the sigmoidoscope showed the ulcers still there, but even a scraping failed to discover living amœbæ, only dead amœba-like bodies being seen. Rivanol was then discontinued for one week, after which the picture of the ulcers had improved, but a spoon-scrape now demonstrated the presence of living entamœbæ. The patient was then put on a course of emetine and stovarsol.

CASE 3, aged 35, was admitted to hospital complaining of diarrhœa 20 times daily, and tenesmus, with blood and mucus in the stools. The history of the onset was sudden, and the duration of the complaint was 45 days. The stools contained living *E. histolytica*, trichomonas, and pus cells. The blood showed a leucocytosis of 13,800. The sigmoidoscope revealed two or three elevated patches of muco-

put on yatren enemata and stovarsol, but he died a week later from right lobar pneumonia.

CASE 5, aged 45, was admitted complaining of diarrhœa, 20 times daily with blood, mucus, and tenesmus. These symptoms had lasted five months, the onset being sudden, but he stated that he had had frequent previous attacks. His liver was tender and he had chronic nephritis with general weakness, œdema of the legs, puffiness of the lids, dyspnœa, and cough. Living *E. histolytica* were found in the stools. On sigmoidoscopy, the large gut was found very patulous, while the mucous membrane showed many depressed hæmorrhagic areas and small punched-out ulcers. The mucous membrane in between was coated with mucus which could easily be swabbed away, exposing healthy mucous membrane underneath. Rivanol, one capsule (0·025 g.) by mouth, was given thrice daily. After two weeks' treatment much the same sigmoidoscopic picture

TABLE SHOWING RESULT OF TREATMENT BY RIVANOL IN AMŒBIC DYSENTERY.

No.	Amœbic ulcers seen by sigmoidoscope.	Entamœbæ present in sigmoidoscopic scrape.	Entamœbæ in stools (lab. or ward).	Treatment (rivanol in grammes).	Result of treatment.
1	+	+	−	0·025 t.d.s. 17 days.	Relapse after 2 months entamœbæ + ulcer present.
2	+	+	+	0·025 ,, 1st week. 0·05 ,, 2nd ,, 0·075 ,, 3rd ,,	After a week's rest entamœbæ present in stools.
3	+	+	+, also trichomonas.	0·025 ,, 1st ,, 0·05 ,, 2nd ,, 0·075 ,, 3rd ,,	After a week's rest entamœbæ +.
4	+	+	+, also Lamblia.	0·025 ,, 10 days.	Stools showed entamœbæ.
5	+	+	+	0·025 ,, 18 ,,	Stools still + for entamœbæ.
6	Very small ulcer.	+	+	0·025 ,, 10 ,,	Do.
7	Small ulcer +.	+	+	0·025 t.d.s., enema 1 : 10,000 (1 week, then enema stopped) continued per os 0·025 t.d.s. for 12 days.	Stools + for entamœbæ.
8	+	+	+	0·025 t.d.s. 1st week. 0·05 ,, 2nd ,,	Entamœbæ− and ulcers healed. Relapse 2 months later with large ulcers and many amœbæ.
9	One small ulcer.	+	+, also Lamblia.	0·025 ,, 20 days.	Ulcer healed. No symptoms for 6½ months.
10	Normal membrane, only sticky mucus.	−	+	0·025 ,, 10 ,,	Negative entamœbæ still negative 2½ months later.
11	Very small ulcer. +	+	+, also Morgan.	0·025 ,, 9 ,,	Do.
12	+	+	−	Enema 1 : 2000, stopped after 1 week local irritation.	Local irritation compelled stoppage of treatment.
13	Punched out ulcers + diffuse inflammation.	+	+, also Flexner.	Rivanol 0·025 t.d.s.; 9 days' wash 1 : 10,000 m.e. 9 days.	Same appearance of ulcers as on admission. Entamœbæ still present.

AVERAGE DURATION OF SYMPTOMS AND SIGNS AFTER STARTING RIVANOL TREATMENT.

	Blood.	Mucus.	Diarrhœa.	Tenesmus.
Days	3·3	3·3	5	3

hæmorrhagic material which, on being swabbed away, revealed small amœbic ulcers underneath. Rivanol, one capsule (0·025 g.), was given thrice daily. Blood, mucus, and tenesmus diminished on the third day, the latter disappearing entirely on the fifth day. After a week of this treatment the sigmoidoscopic picture remained the same. Rivanol was then increased to two capsules three times daily by mouth for another week, after which the ulcers were seen to be somewhat smaller, but the scrapings still contained *E. histolytica*. Rivanol was further increased to three capsules (0·075 g.) thrice daily. Next day the blood and mucus had disappeared, and no amœbæ were found in the stools. At the end of the third week, after the completion of this intensive rivanol course, the sigmoidoscope still showed ulcers, but scrapings from these only demonstrated immobile amœbæ-like bodies. Rivanol was then stopped for one week, at the end of which time the same ulcers were seen on sigmoidoscopy and material obtained by scrapings now contained living *E. histolytica*. A course of emetine and stovarsol was then given.

CASE 4, aged 40, was admitted to hospital complaining of diarrhœa, five to seven times daily, with blood, mucus, and tenesmus of two months' duration. The onset of the disease was gradual. The stools contained blood and mucus, and the microscope revealed *E. histolytica* and lamblia. Sigmoidoscopy showed depressed square-shaped hæmorrhagic ulcers, with healthy mucous membrane in between. Rivanol one capsule (0·025 g.), thrice daily, was given for ten days by mouth, after which time the stools still contained *E. histolytica*. Rivanol was stopped and the patient was

was seen, the mucous membrane being studded with small punched-out ulcers having yellowish bases in some and hæmorrhagic spots in others. The rivanol treatment was continued for 18 days, after which the sigmoidoscopio picture had improved somewhat. The stools looked normal in appearance, but living amœbæ were still present. Stovarsol was therefore started, and 12 days later sigmoidoscopy showed a normal mucosa, and scraping was negative for amœbæ.

CASE 6, aged 42, complained on admission to hospital of diarrhœa 10 to 12 times daily with blood, mucus, and tenesmus. These symptoms had commenced gradually ten days previously. The stools were liquid, containing blood, mucus, and living *E. histolytica*. Through the sigmoidoscope tiny elevations with central pits were observed, and with the aid of the magnifying glass they were seen to be very early amœbic erosions, very little ulceration having yet taken place. Rivanol, one capsule (0·025 g.), three times daily, was given by mouth for ten days, on the fourth day of which treatment blood, mucus, and tenesmus had disappeared. The stools became solid on the seventh day. Amœbæ had disappeared from stools by ordinary microscopic examination without scrapings by the ninth day of treatment. On the tenth day tenesmus reappeared, and the sigmoidoscope revealed small areas indicating amœbic infection of the bowel wall. Material by scraping was positive for *E. histolytica*. The patient was then put on stovarsol.

CASE 7, aged 27, complained on admission to hospital of diarrhœa seven times daily with blood, mucus, tenesmus,

and colicky pains. The onset had been gradual and the condition had persisted for two years. The stools, in addition, to mucus and blood, contained living *E. histolytica*, and the mucous membrane on sigmoidoscopy showed small circular hæmorrhages and tiny punched-out ulcers, with here and there some blood-stained mucus adhering in the bowel wall. Scrapings under the microscope showed living amœbæ. The patient was put on rivanol, one capsule (0·025 g.), thrice daily by mouth, and rivanol rectal enema 1 : 10,000 retained as long as possible. One week later, through the sigmoidoscope, the same picture was seen with some superadded inflammation and sticky mucus low down in the gut, probably the result of irritation from the rivanol enemata which were then stopped. After 12 days of rivanol per os the mucous membrane still looked unhealthy with sticky mucus. Rivanol was stopped and an emetine course given, and under this treatment the ulcerations disappeared.

CASE 8, aged 45, was treated as an out-patient, and attended in the ward every week for observation. He complained of attacks of diarrhœa with tenesmus, mucus, and blood in the stools, these symptoms coming and going irregularly throughout a period of six months. The first attack came on suddenly, the average daily number of motions being seven or eight. The stools contained mucus and blood. Microscopical examination revealed the presence of living *E. histolytica*. The sigmoidoscope showed scattered, depressed amœbic ulcerations with healthy mucous membrane in between; spoon-scrapings contained living entamœbæ. The patient was given one capsule of rivanol (0·025 g.) thrice daily for the first week and two capsules thrice daily for the next two weeks. Tenesmus disappeared on the second day of treatment, and on the third day the stools had regained their normal appearance and consistency, and blood and mucus had disappeared. After the first week of rivanol treatment the sigmoidoscope showed much improvement in the ulcers, and entamœbæ were not found by a spoon-scrape. A week later the mucous membrane appeared quite healthy, and continued so through the following weeks. When the patient was seen a month later, after stopping the rivanol, he did not complain of anything, and the sigmoidoscope showed a normal mucosa. The patient reported, two months after completion of the rivanol treatment, with a return of his dysenteric symptoms; the sigmoidoscope then revealed extensive amœbic ulcerations, and active *E. histolytica* were seen under the microscope. He was put on yatren treatment.

CASE 9, aged 28, was admitted to hospital with severe anæmia and diarrhœa of one month's duration without blood or mucus, but with tenesmus. The onset of the diarrhœa was gradual and the number of the stools varied from seven to ten a day. The stools were loose and pale in colour. No naked-eye mucus or blood was seen, but the immediate examination in the ward and later in the laboratory revealed the presence of living *E. histolytica*. The sigmoidoscope showed a healthy mucous membrane except for the presence of a little depressed hæmorrhagic ulcer 20 cm. up. The patient was put on rivanol capsules by the mouth (each 0·025 g.), one capsule thrice daily for 20 days. On the twelveth day of treatment the diarrhœa had disappeared. On the last day of rivanol treatment the patient showed by sigmoidoscope a normal mucosa. He was put on ferrum redactum for his anæmia, and when seen six and a half months later he did not complain of any symptom. The sigmoidoscope then showed a few hæmorrhagic spots low down in the gut, but the material obtained by the spoon did not show any *E. histolytica*.

CASE 10, aged 40, was admitted to hospital complaining of colicky pains in the abdomen, tenesmus, and diarrhœa with mucus and blood, lasting for five months. The onset of the disease was gradual, the number of stools being 12 to 15 a day. The naked-eye examination of the stools showed the presence of blood and mucus. Immediate examination in the ward and later in the laboratory revealed the presence of *E. histolytica*. No amœbic ulcers were seen by the sigmoidoscope, the mucous membrane appearing normal except for some mucus sticking to it; bleeding was readily produced during the passage of the sigmoidoscope. The patient was given rivanol by the mouth, one capsule (0·025 g.) thrice daily for ten days. On the second day of treatment the diarrhœa dropped from 12 times to an average of three times daily. On the fourth day the appearance of the stools was almost normal, and on the fifth day tenesmus had ceased and blood and mucus were absent; by the tenth day the stools were quite solid and normal in appearance. Examination of material obtained by spoon-scrape before the patient was discharged did not show any living *E. histolytica*. Re-examined two and a half months later, he complained of no symptoms, and the sigmoidoscopic picture showed only a moderately congested mucosa, scrapings being still negative for *E. histolytica*.

CASE 11, aged 45, was admitted to hospital complaining of diarrhœa, colicky pains in the abdomen, tenesmus, and blood and mucus in the stools. The onset was gradual and the duration of the symptoms only five days. The patient passed three to four motions daily. The stools were liquid and contained blood and mucus and living *E. histolytica*. Morgan's bacillus was also isolated on culture. The sigmoidoscope showed abrasions in the mucosa and also small depressed pits with slightly elevated inflamed rims. The patient was given rivanol, one capsule (0·025 g.) thrice daily for nine days. Diarrhœa, tenesmus, blood, and mucus disappeared on the third day of treatment, and by the fifth day the stools had regained their normal appearance. After the course was completed the picture of the gut did not reveal any abnormality to the sigmoidoscope on several occasions. The patient was seen two and a half months later, complaining of no symptoms. The sigmoidoscope showed no ulcerations, and the spoon-scrapings were negative for *E. histolytica*.

CASE 12, aged 18, was admitted to hospital complaining of diarrhœa, with blood, mucus, and tenesmus for 40 days. The onset of the disease was sudden, the number of motions varying from two to eight a day. The patient gave a history of relapses during the preceding five years. Small, scattered, punched-out yellow ulcers and hæmorrhagic depressed areas were seen through the sigmoidoscope, with healthy mucous membrane in between. The patient was put on rivanol wash by rectum in a strength of 1 : 2000 daily, but this was stopped after a few days owing to his complaint of local irritation, intense inflammation being seen by the sigmoidoscope. The patient was then put on stovarsol treatment.

CASE 13, aged 19, was admitted markedly emaciated, complaining of diarrhœa with blood, mucus, and severe tenesmus. The onset of the disease was sudden, commencing 15 days previously. The daily number of motions was four. The stools were mixed with blood, mucus, and pus. Living *E. histolytica* were detected in the stools in the ward and laboratory, and *B. dysenteriæ* Flexner was also isolated on culture. The sigmoidoscopic picture showed numerous punched-out ulcers typical of amœbic dysentery. The mucosa between these amœbic ulcers was moderately congested, bleeding readily, and covered with blood-stained mucus, an appearance typical of bacillary dysentery. The patient was put on rivanol capsules (0·025 g.) thrice daily for nine days and rivanol enemata 1 : 10,000 twice daily for the same period; at the end of it the same punched-out ulcers were still seen in the gut, and amœbæ were seen microscopically.

In only three cases (Nos. 9, 10, and 11) have we been able to obtain results that may be looked upon as satisfactory; the period of observation in these three cases, however, is much too short for anything like a cure to be claimed. No. 9 has been free from symptoms and has shown no pathological sigmoidoscopic changes during a period of six and a half months, while Nos. 10 and 11 have only been observed free from symptoms for two and a half months. The bowel lesions in these three cases were very slight from the first, No. 10 appearing normal sigmoidoscopically. In all the other cases in our series, except No. 12 where treatment had to be discontinued owing to local irritation, adequate doses of rivanol were administered over a sufficiently long period, but within a short time of the termination of the treatment actively motile *E. histolytica* were readily demonstrated in the material obtained from the intestines. In one case (No. 8) the ulcers were observed to heal during rivanol treatment and symptoms to disappear, but a relapse occurred two months later, when large amœbic ulcers were again seen in the lower bowel and actively motile entamœbæ were demonstrated microscopically. In three cases (7, 12, and 13) rivanol enemata were employed. A strength of 1 : 2000 was found to produce marked local irritation both subjectively and as seen through the sigmoidoscope. A strength of 1 : 10,000 was used in Cases 7 and 13 in addition to rivanol orally (0·025 g. thrice daily) given at the same time. Even this combination did not effect a cure. Very large oral doses were given in Cases 2 and 3, rivanol 0·025 g. thrice daily being given for the first week, 0·05 g. thrice daily for the second week, and 0·075 g. thrice daily for the third week. No toxic symptoms resulted from these large doses but entamœbæ still persisted after the completion of the course.

Relief of Symptoms by Rivanol.

The symptoms of diarrhœa, tenesmus, and passage of blood and mucus were very greatly relieved during the rivanol treatment and, as a result, these patients experienced very considerable comfort. The first symptom to be relieved was tenesmus, which was found to disappear in an average of three days from the commencement of the treatment. Naked-eye blood and mucus next disappeared from the stools, this taking place in an average of 3·3 days; the stools, however, did not regain their normal consistency until, on an average, five days after the commencement of the rivanol treatment.

The relief of symptoms in these cases is doubtless due to the anæsthetic and antispasmodic properties of the drug. The cleansing and healing effect observed on the ulcers is probably due to the antiseptic action of the drug on the superadded infection. There seems unfortunately to be only a very mild specific lethal action on the entamœbæ themselves, as in most cases, after a short period of rest from the treatment, actively motile entamœbæ can again be readily demonstrated.

The drug has been employed by us for its sedative action in cases of rectal bilharziasis where tenesmus has been a marked and troublesome symptom.

Conclusions.

Rivanol administered as a local application rectally has been found to be irritating to the mucosa in a concentration of 1:2000, marked hyperæmia of the rectal mucous membrane as viewed through the sigmoidoscope having resulted. In a dilution of 1:10,000 no lethal effect on the entamœbæ has been noted.

Rivanol administered orally, even in doses as high as 0·075 g. thrice daily, has not been found to produce any toxic effects on the individual nor has it been observed to have any markedly lethal action on the entamœbæ. In only three very mild amœbic infections were we able to get rid of the dysenteric symptoms and free the bowel from *E. histolytica* for any considerable period. All our other cases soon showed a return of the symptoms and their intestines were found still to harbour active vegetative forms of *E. histolytica*, either immediately or shortly after discontinuing the drug. Marked relief from symptoms was, however, experienced in most cases during the course of treatment, tenesmus, blood, mucus, and diarrhœa soon disappearing, usually to return shortly after stopping the rivanol.

We consider that the antispasmodic and antiseptic action of the drug may with advantage be utilised for the relief of colic and tenesmus, and for assisting in cleansing the bowel of some of the superadded infection in various dysenteric conditions where lower bowel symptoms are a marked feature of the disease.

We wish to express our thanks to the following house physicians for their assistance in carrying out the investigations on these cases: Dr. Nishokaty, Dr. Shukry, and Dr. Fikry.

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MOTOR ACCIDENTS AT ALTRINCHAM.—The General Hospital at Altrincham, in mid-Cheshire, stands upon a road much used by motor traffic, and consequently receives many accident cases. In 1929 it took in 156 sufferers from road accidents, who stayed for a total of 3639 days; one of them occupied a bed for 11 months, and others remained for eight and nine months.

THE ORAL INJECTION OF LIPIODOL

AS AN AID TO THE DIFFERENTIAL DIAGNOSIS OF UPPER LOBE BRONCHIECTASIS AND PULMONARY TUBERCULOSIS.

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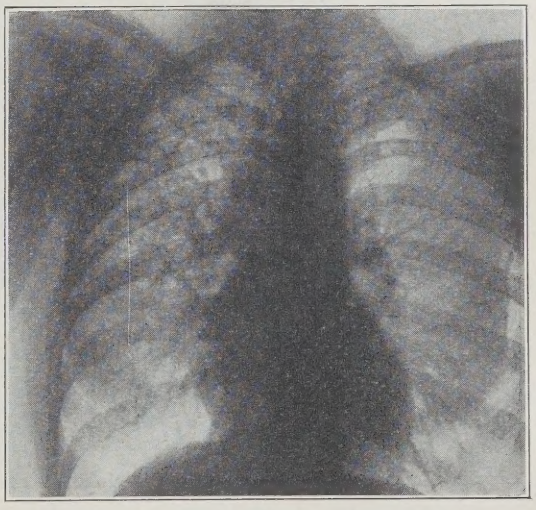
THE clinical picture in a case of well-marked basal bronchiectasis is usually clearly defined. The characteristic odour of the breath, the copious purulent sputum, the clubbed fingers, and the physical signs of consolidation and excavation make diagnosis easy. When, however, an upper lobe is the seat of the trouble the resemblance to the chronic fibroid type of pulmonary tuberculosis may be close, even when the disease has reached an advanced stage. In such a case the erect position ensures continuous drainage which is more effective than that obtained by occasional posturisation such as is practised by sufferers from basal disease. The sputum is less copious and may be inoffensive. There is less constitutional disturbance and there may be no clubbing of the fingers. The added sounds may have a dry quality compared with the bubbling râles due to accumulated secretion. Apart from the absence of tubercle bacilli in the sputum a diagnosis of pulmonary tuberculosis would seem justified. Difficulties in diagnosis are overcome by the use of lipiodol, and its administration by the oral route in suitable

FIG. 1.



Bronchiectasis of the right upper lobe before the injection of lipiodol.

cases provides the easiest means of arriving at a correct solution.

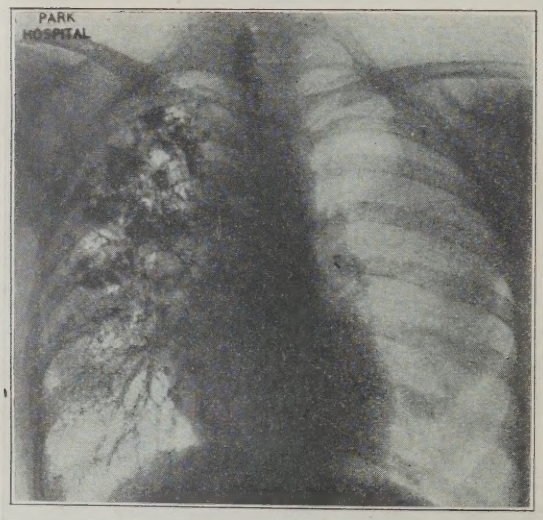
A woman aged 28, a clerk, first visited the out-patient department at Victoria Park Hospital in 1921, complaining of cough. She attended for some months. There was a history of pneumonia in infancy and the case was regarded as one of pulmonary fibrosis. No tubercle bacilli were found in the spit. In 1924 she attended the tuberculosis dispensary attached to the hospital on account of chronic cough and blood-stained expectoration. The physical signs were consistent with a diagnosis of chronic phthisis; there was impairment of the percussion note over the upper half of the right side of the chest, and crepitations were heard in the same area. But the sputum was still negative for

tubercle bacilli, and though the case had been notified as tuberculous, Dr. H. T. Howell was not prepared to accept this diagnosis. She continued to attend the dispensary at intervals during the next six years owing to frequent re-notifications elsewhere. (T.B. 0, 1924 (4), 1925 (1), 1927 (1), 1930 (2)). Cough persisted but there was no deterioration in the patient's general condition, and the weight remained constant.

In February, 1930, the patient's panel doctor noted an apparent extension of the signs of disease in the right lung. On account of this she was sent to a general hospital where a skiagram was taken. The radiologist reported that there was evidence of chronic phthisis of both lungs and the patient was again referred to the dispensary. It was at this stage that Dr. Howell, who was not satisfied with this explanation of the condition, asked me to see the patient. The physical signs in the chest, noted above, had persisted while harsh breathing heard below the right clavicle indicated that there was probably cavitation in this region. A skiagram taken at Victoria Park showed numerous linear shadows radiating upwards to the level of the clavicle and outwards to the periphery. The appearances were those associated with extensive fibrosis of the right upper lobe. The lower half of the lung field showed no abnormality. In view of the history of the case, the physical signs and X rays, a tentative diagnosis of bronchiectasis of the right upper lobe was made (Fig. 1). After a preliminary test for iodine intolerance an injection of lipiodol was administered by the oral route on March 20th. A skiagram taken immediately after the injection showed that the whole of the right upper lobe was riddled with cavities, the bronchi of the lower lobe being normal (Fig. 2). A further skiagram taken in the erect position showing clearly defined fluid levels indicated the presence of some forty cavities. The picture was quite unlike that seen in fibroid phthisis and the diagnosis of bronchiectasis was thus confirmed (Fig. 3).

The injection of lipiodol by the oral route is seldom practised in this country, but in selected cases it is

FIG. 2.



After the injection; patient in the prone position.

a method suitable for out-patient work, since it dispenses with the need for tracheal puncture and the injection of cocaine. A brief note on the technique of this method may therefore be of service.

The method is unlikely to succeed and should not be attempted when the patient is a child. A measure of intelligence and a willingness to coöperate on the part of the patient are also essential. Further, unless a clear view of the pharynx is obtained when the mouth is widely opened and the tongue extruded it is useless to inject by the oral route. In the absence of these contra-indications success may be expected in a considerable proportion of cases. If the method fails injection by the cricothyroid route is indicated, and for this admission to hospital, though not essential, is desirable.

The confidence of the patient having been gained, he is instructed to take hold of the tongue with a dental napkin and to draw it well forwards and slightly downwards, keeping the mouth as widely open as possible. In this posture deep breathing through the mouth must be practised several times a day for a few days preceding the injection. With

FIG. 3.

After the injection; patient erect.

a little practice the patient will overcome the initial discomfort of the position.

For the injection the patient lies upon an operating table, supporting the head upon the right or left arm in such a way that the side of the chest to be injected is inferior, and leans upon the corresponding elbow. The attitude thus resembles that of a guest at a Roman banquet, and has been described by Dr. J. J. Singer as "the Cleopatra position." The foot of the table is now slightly lowered. A 20 c.cm. syringe fitted with a straight cannula 10 cm. in length and 2 mm. in diameter is filled with warm lipiodol. The proximal end of the cannula is steadied against the upper jaw of the patient, and the distal end projected into space between the tonsil and the uvula. It is obviously important to avoid touching the palate, pharyngeal wall, or tongue if retching is to be avoided. Injection of a few drops of oil is made during each inhalation with pauses during expiration. If this precaution is neglected oil will be blown into the mouth by the force of the expired air. Two or three minutes should suffice for the injection of 20 c.cm. If the injection is proceeding satisfactorily a slight gurgling sound will indicate that the oil is passing down the trachea. (A completely silent injection is evidence that the patient is swallowing the oil, a fact which may be verified later by X ray examination of the stomach.) Directly this has been accomplished the table is tilted head downwards to the full extent to ensure the flow of oil to the summit of the lung. The patient is then taken on a stretcher to the X ray department, remaining in a horizontal position till the first skiagram has been taken.

My acknowledgments are due to Dr. H. T. Howell, senior tuberculosis officer for Bethnal Green and Hackney, who kindly brought to my notice the patient whose case is described, and supplied notes on the past history.

A NEW TECHNIQUE COMBINING THE USE OF SURGERY AND RADIUM IN THE TREATMENT OF CANCER OF THE BREAST.

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THE objective aimed at in the radical treatment of cancer of the breast is the complete removal or destruction of the growth, however far it may have extended. The success of any procedure depends on its capacity for dealing with all-important paths of spread. These are grouped as follows:—

1. *Local growth*, spread along the tissue spaces and through the alveoli and ducts themselves.
2. *Lymphatic dissemination.* (*a*) Growth along lymphatic plexuses lying on fascial planes; (*b*) growth along lymphatic channels lying along vessels; (*c*) embolus along lymphatic ducts.
3. *Blood spread.* (*a*) After advanced lymphatic invasion; (*b*) early, after embolus following direct invasion of venous channels.

Complete cure can only be hoped for in those cases where lymphatic dissemination is limited. If blood spread has occurred, whether clinically recognisable or not, the growth is beyond cure by local treatment.

The procedures at present in use in dealing with carcinoma of the breast may be grouped as follows: (1) Surgery alone—extensive radical amputation. (2) Radium (or radon) alone, with needles, using Keynes's technique. (3) Radium and surgery. (4) Radium bomb.

The comparative claims of the first two procedures are those on which general attention is at present focused. In a well-planned surgical operation the local infiltration is removed and an attempt is made by wide excision of fascia to eradicate the growth that has spread by permeation. Lymphatic spread, however, can only be dealt with to the limited extent that a careful clearance of the axilla affords. With radium alone destruction of the local growth is not so certain, but a more definite attack is made on the line of spread into the supraclavicular triangle and into the anterior extremities of the upper intercostal spaces.

The results obtained by Sampson Handley in his recent cases[1] show an improvement on those of his previous series which, he suggests, may be due to the addition to his technique of inserting radium in the supraclavicular fossa and in the anterior extremity of the intercostal spaces.

The possible limits of the application of radium to the lymphatic spread have not yet been explored. Observations in the post-mortem room of advanced cases of cancer of the breast show that, where lymphatic spread has been slowly progressive, the upper intercostal spaces on the affected side, looked at from the pleural aspect, are frequently outlined by growth throughout their whole extent and the supraclavicular region is infiltrated by it. The growth could reach these intercostal spaces either through the anterior extremities or laterally, as in both these situations vessels and accompanying lymphatics perforate the external intercostal muscle. It is not as yet certain whether we are justified in regarding the spread along the intercostal spaces as occurring chiefly forwards or backwards, although it has been generally assumed that it occurs chiefly towards the spine.

Certain experiments made in the Bland-Sutton Institute with the Brown-Pearce tumour, which has both lymphatic and blood spread, may have some bearing on this question of direction of spread in the intercostal spaces. Inoculations of an emulsion of this tumour into the intercostal muscles of two rabbits have on each occasion shown little spread backwards but have produced growth in the anterior mediastinum massive enough to cause marked pressure effects. Further investigations are being made.

[1] Handley, W. S.: Surg., Gynecol., and Obst., 1927, xlv., 721.

In view of our limited knowledge of spread along this path the only safe course is to assume spread from both directions. The intercostal spread, therefore, has been dealt with by the insertion of radium needles between the intercostal muscles of the upper five or six spaces from the anterior extremity to a point posterior to the egress of lateral nerves. Only when a radical breast operation has been performed can radium be placed accurately between the intercostal muscles and in the desired situations in the axillary and supraclavicular spaces.

Investigations as to the immediate results of such a combined technique have been made, and this report is based on the results of a short series of unselected cases under my care during the six months from the middle of December, 1928, to the middle of June, 1929. Since that time, owing to the shortage of radium in the Middlesex Hospital through rearrangement of tubes, the work has been interrupted, but the cases have been reviewed within the last month for the purpose of this preliminary report.

FIG. 1.

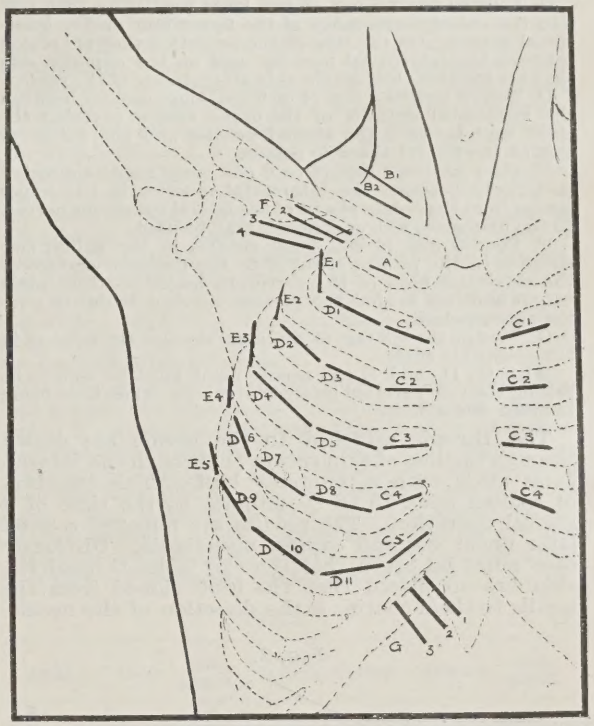

Diagram showing position of needles.

Technique of the Operation.

Operation, apart from the preliminary skin incision and dissection of the axilla, has been carried out with the diathermy knife. (It is essential that charring on the inner surface of the reflected skin flap be minimal, and if the diathermy is not working well it is better to resort to the scalpel.) In cases associated with ulceration and fungation the affected area is cauterised by diathermy before the reflection of skin flaps. If this cauterisation is carried out efficiently and the spread is not too extensive, the ordinary radical operation is performed but, if efficient cauterisation is impossible, if the growth is obviously too far advanced, or if marked sepsis is present, an extensive operation is contra-indicated and the operation and radium insertion are both modified.

A skin incision widely encircles the growth and skin flaps are reflected to the clavicle, the opposite side of the sternum, the epigastric angle, and posteriorly beyond the anterior border of the latissimus dorsi.

This is followed by removal of a wide area of fascia, including that covering the upper portion of the rectus and the clavicular part of the pectoralis major, the sternal head of the pectoralis major, and the pectoralis minor. Finally, the axillary glands are dissected out. The lateral thoracic nerve branches are left long at first as a guide to the insertion of the long posterior intercostal needles.

Radium is then inserted along the possible directions of spread beyond the limits of operation.

The following is the general distribution (Fig. 1), minor modifications being made according to the site of the tumour.

A. One 1·5 mg. (2 cm. long) needle above the first rib anterior to and below the axillary vein after clearing out the minute pocket in this situation.

B. Two 3 mg. (4 cm. long) needles above the clavicle. These are inserted through the skin of the supraclavicular triangle with a guiding finger in the axilla protecting the plexus and vessels.

C. Four or five 2·5 mg. (3 cm. long) needles on each side into the anterior extremity of the upper four or five intercostal spaces. On the side of the operation they are placed between the intercostal muscles, and on the opposite side they are inserted through the skin after closure of the wound.

D. Ten or twelve 3 mg. (4 or 6 cm. long) needles between the intercostal muscles of the upper spaces, covering the chest wall between the sternal needles and the points of exit of the lateral thoracic nerves.

E. Four or five 3 mg. (4 or 6 cm. long) needles directed posteriorly between the intercostal muscles in the upper spaces from the points of exit of the lateral cutaneous nerves. In the first space a shorter needle may be used.

F. Four 3 mg. (4 cm. long) needles in the axilla, two anterior to the plexus, stitched to the posterior surface of the clavicular head of the pectoralis major with fine plain catgut and two behind the plexus, stitched to fascia over the subscapularis.

G. Two or three 3 mg. (4 cm. long) needles are stitched in the epigastric angle.

With C., D., and E the needle point must be seen to be raising the thin external intercostal muscle while it is being inserted beneath it.

The threads attached to the needle are drawn through the line of skin suture or through special stab holes made with a tenotomy knife. This insertion of radium adds 15 to 20 minutes to the time of a radical operation. The needles are removed a week later under gas and oxygen anæsthesia. Obviously care must be taken that the exit holes through the skin are so placed that the taut thread from the needle to them continues the direction of the needle.

FIG. 2.

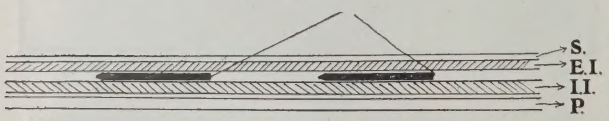

Diagram of section of chest wall to show position of radium needles. S. = skin. E.I. and I.I. = internal and external intercostal muscles. P. = pleura.

Thread direction as in A will ensure easy removal and allow for slight displacement. With thread direction as in B the needle will be tilted during withdrawal with risk of damage to the underlying pleura. No force should be used in withdrawing the needle. If the slightest resistance is experienced a small stab through the skin on to the butt-end of the needle ensures safe removal.

The Case Reports.

The series consists of two groups: *Group A* comprises seven cases with full technique—i.e., complete radical amputation and full use of radium. Most of them showed very little reaction. Two or three developed diffuse erythema with an œdematous condition of the skin over the area of treatment. Three cases developed pain over the distribution of the inner cord of the brachial plexus. This pain remained for some months. These cases are at present all well and apparently free from recurrence at the end of a period of from 7 to 13 months. *Group B* comprises three cases treated with modified technique, limited amputation, and modified use of radium. Two of these were advanced and ulcerated cases. One died as a result of sepsis following operation and one from distant metastases six months later with no signs of growth near the operation site.

The following are brief notes of the cases in the two groups:—

Group A.—1. Aged 60. Duration nine months. Rounded growth, 1½ in. in diameter in region of nipple with some puckering of skin. Firm lymph glands <½ in. Moderate malignancy.[2] Breast showed cancer histologically but glands nil. Operation December, 1928. Present condition (February, 1930): no symptoms and no evidence of recurrence.

2. Aged 69. Duration over a year. Rounded growth 1½ in. in diameter in region of nipple. Attached to skin (much puckering) and to underlying muscle. Lymph glands firm >½ in. Low malignancy. Breast +, glands +. Operation, December, 1928. Present condition: no symptoms, no evidence of recurrence.

3. Aged 45. Abscess in breast 1914. Lumpy near site of old abscess for six week. Rounded growth 1½ in. in diameter, situated near nipple, upper and inner quadrant. Attached to skin and causing elevation of nipple. Glands >½ in. High malignancy. Breast +, glands +. Operation February, 1929. Present condition: no symptoms, no evidence of recurrence.

4. Aged 41. Duration over 12 months. Complained of pain in arm and shoulder. Growth axillary tail 1½ in. in diameter adherent to skin. Glands >½ in. firm. Moderate malignancy. Breast +, glands +. Operation April, 1929. Present condition: occasional slight pains in side and shoulder. No evidence of recurrence.

5. Aged 41. Duration: lump four months. Large growth 2 in. in diameter, axillary quadrant attached to skin and underlying fascia. Glands >½ in. Moderate malignancy. Breast +, glands +. Operation May, 1929. Present condition: no symptoms, no evidence of recurrence.

6. Aged 37. Duration: lump three years, rapid growth three months. Large mass in axillary quadrant, 2½ in. in diameter. Wide skin involvement. Glands >1 in. Moderate malignancy. Breast+, glands+. Operation June, 1929. Present condition: no symptoms, no evidence of recurrence.

7. Aged 37. Large lump in outer and lower quadrant, attached to skin. Glands felt in axilla. Typical cancer on incision after operation. No pathological report on this specimen. Operation June, 1929. Present condition: occasional pain in wound and down inner side of arm. No evidence of recurrence.

Group B.—1. Aged 66. Duration 6 years. Nine months ulceration and discharge. Large irregular growth 3½ in. in diameter, replacing breast and extending through muscle. Glands >½ in. High histological malignancy. Breast +, glands+. Operation December, 1928. Breast and pectorals removed, largest glands dissected from axilla. Edges of skin stitched to deep structures. Limited use of radium. Death from general toxæmia 21 days after operation.

2. Aged 46. Duration 3 months, 1 month ulceration and fungation. Enormous fungating mass replacing the left breast, 4in. in diameter, fixed to muscle with hard glands >1in. in axilla. Low malignancy. Breast +, glands+. Modified operation April, 1929. Edges of skin stitched to fascia, limited use of radium (16 needles). Returned in September, 1929, complaining of pain in back, right hip, and leg. Secondary deposits in vertebræ and pelvis shown by X rays. No local recurrence. Death in October following paraplegia associated with pain in dorsal region.

3. Aged 49. Duration 18 months. Lump ¾ in. in diameter in lower and inner quadrant near periphery. Attached to skin and deep fascia. No glandular involvement. Moderate malignancy. Breast +, glands not found. Operation June, 1929, limited because of collapse of patient while skin flaps were being reflected. Thirty needles of radium. Present condition: no symptoms, no evidence of recurrence.

Note.—The figures indicating size refer to measurements of actual growth and of glands by the pathological department after incision.

Conclusion.

The series is small and the survival interval too short to allow any comparison of the efficiency of this with that of any other method of treatment of cancer of the breast. The results are presented for consideration because they appear to establish the possibility of a more extensive attack on local and lymphatic spread by the combined use of surgery and radium than can be achieved by either alone.

[2] Patey, D. H., and Scarff, R. W.: The Position of Histology in the Prognosis of Carcinoma of the Breast, THE LANCET, 1928, i., 801.

IMMUNISATION OF THE MALTESE GOAT BY MEANS OF CUTANEOUS VACCINATION.

BY SIR THEMISTOKLES ZAMMIT, C.M.G., M.D.,

AND

J. E. DEBONO, M.D.

(*From the Public Health Department, Valetta.*)

IN December, 1928, an informal report was presented to the head of the Government by one of us (T. Z.) upon the continued and prevalent use of unboiled milk in Malta. In face of the widespread *Micrococcus melitensis* infection amongst the milch animals and the absence of administrative measures aimed at preventing the distribution of unsterilised milk, this report suggested that further methods must be sought for preventing the infection of milch animals, since none of the customary means of prophylactic vaccination had yielded practical results. It further pointed out that *M. melitensis* infection was readily produced through the damaged skin, and there was much evidence to show that milch animals, particularly goats, were commonly infected by this route, especially through the tender skin of the udders. Owing to their immoderate size, these organs are especially liable to become scratched and to come in contact with the urine of the infected animals. Hard fodder, accidentally impregnated with infective material, is probably another source of infection by wounding the mucous membrane of the mouth. Indeed, it is probable that when infected milk is consumed the actual site of infection is the buccal cavity itself and not the intestinal tract.

In view of these facts, Besredka's method of local cuti-immunisation might logically be expected to prove of value, and it was suggested that investigations in this direction would be useful. The suggestion was approved by the Government, and the Legislative Assembly voted the sum of £250 to defray the cost of preliminary experiments. The following is a summary of the work already carried out.

In planning our experiments our first object was to ascertain what measure of protection could be conferred on goats by simple dermal vaccination, and incidentally to ascertain whether *B. abortus* Bang could be substituted for *M. melitensis* in the preparation of the antigen, for the cultures of the latter organism are more dangerous to handle.

First Series of Experiments.

The antigen first used was prepared as follows :—

Nutrient broth (+8 Eyre's scale) was inoculated with a newly isolated culture of *M. melitensis* obtained from the Public Health Department and incubated at 37° C. for twenty-four days. At the end of this time the reaction of the broth had undergone a change to +2, and it became turbid owing to the luxuriant growth of the organism. It was then filtered through a Chamberland filter candle and the sterility of the filtrate proved by the absence of growth on agar subcultures. The same *melitensis* strain, when reinoculated into the filtrate, failed to develop. The antigen was completed by the addition of tricresol in a concentration of 0·5 per cent. Goats were exclusively employed in our experiments. They were kept in a cool, clean, and airy place ; they were well fed and the rectal temperature was taken daily at 5 P.M.

Seven goats were employed in this series. On preliminary examination three of the animals gave a positive serum reaction. This was unfortunate, for it showed that the goats had been drawn from a tainted herd, and possibly the other goats, despite a negative serum reaction, might be in an initial stage of the infection. These three infected goats were at once replaced, but owing to pressure of time the new goats could not be kept under observation for more than a week, and later events made it probable that one of the fresh animals was incubating the disease during the experimental period.

Of the seven goats, one was retained as a control ; the remaining six were each treated as follows :—

The belly was washed with soap and water and the base of the udder shaved with a safety razor. About 10 c.cm. of the filtrate were sprayed over the mammary area and into the mouth by means of an atomiser. One c.cm. was also injected intradermally in four places at the base of the udder.

The treatment was repeated five times on alternate days. The blood-serum of all the goats was repeatedly examined for specific agglutinins, but none was observed except in one of the new goats, No. 6, referred to above, which gave a reaction of 1 in 160. It is improbable that this reaction was due to the treatment, since it was absent in the other goats, and we have every reason to suspect that it was due to an infection acquired before the goat came into our possession.

Two days after the last treatment all the goats, including the control, were inoculated subcutaneously with 1 c.cm. of an emulsion of living (virulent) *M. melitensis* (approximately 3000 millions). The milk of all the animals was plated every four days, and a specimen of blood was taken for hæmoculture every week. No untoward symptoms were noticed until the fourth day, when there was a sharp rise of temperature to 105° F. in the control. This persisted for three days, and then came down gradually. Eight days after inoculation the serum reaction of all goats became positive in dilutions varying between 1/80 and 1/160, but in the control it went up to 1/320. On the eighth day the organism was recovered in great abundance from the milk of the control, and persisted until the milk dried up completely four weeks after infection. In spite of repeated attempts, *M. melitensis* could not be obtained from the milk of the other goats, except once from No. 6, which, as already explained, was under considerable suspicion. Hæmocultures were negative except in the case of goat No. 3, which proved positive four weeks after infection.

Six weeks after infection all the goats were killed and a complete post-mortem examination was carried out. No gross pathological changes were observed. Portions of the spleen, kidney, and liver, and of the mammary, inguinal, and mesenteric glands were removed and plated on liver-infusion-gentian-violet agar. The plates were kept under observation for 15 days and suspicious colonies were subcultured and examined both microscopically and by the agglutination test. The results are shown in Table I.

TABLE I.

Goat.	Liver.	Mes. gland.	Spleen.	Kidney.	Mamma.	Ing. gland.
1	—	—	—	—	—	—
2	—	—	—	—	—	4 cols.
3	—	—	—	—	—	3 cols.
4	—	—	—	—	—	—
5	—	—	—	2 cols.	—	—
6	+	—	+	+	+	—
Control ..	—	—	+	—	+++	+++

Result.—Two animals successfully resisted infection ; in three others the infection was light.

Note.—The numbers refer to the number of colonies identified ; + means infection. Goat No. 6 we consider was already infected when bought.

Second Series.

The same technique was followed but a different antigen was employed.

The broth culture was not filtered, but devitalised by the addition of tricresol and used without further preparation. This series comprised five goats, one being reserved as a control. After the five treatments, the blood-sera of each of the vaccinated goats gave a positive reaction thus : No. 8, 1 in 320 ; No. 9, 1 in 640 ; No. 10, 1 in 640 ; No. 11, 1 in 1280 ; control, nil. The reactions in this case were obviously due to the intradermal injection of the bodies of the dead or devitalised microbes.

Two days after the last treatment (twelve days after the first) all five goats were infected by rubbing an emulsion of living *melitensis* over a slightly scarified area of skin measuring about a square inch. Again no signs of infection were noticed, even in the control.

As the goats were not milking, the milk could not be tested. The serum reaction remained unaltered in titre in the vaccinated animals, but the control invariably gave a negative result. Hæmocultures were attempted every week, but with negative results. Owing to the non-appearance of the serum reaction in the control we waited eight weeks before destroying the animals. Eventually they were killed and the usual organs were plated as in the previous experiment, with the result given in Table II.

TABLE II.

Goat.	Liver.	Mes. gland.	Spleen.	Kidney.	Mamma.	Ing. gland.
8	—	—	—	—	—	+
9	—	—	—	—	—	—
10	—	—	—	—	—	+
11	—	+	+	—	—	—
Control ..	—	++	—	+	+++	+++

Result.—One animal successfully resisted infection.

Third Series.

The antigen was again varied and this time a sterilised unfiltered broth culture of *B. abortus* was employed. This strain was kindly furnished by Dr. Weigmann, of Copenhagen, through the good offices of Prof. Maurizio Ascoli, of Catania. The third series comprised only three goats, of which one was retained as a control. The treatment was the same as in the second experiment, and the *melitensis* infection was induced by scarification. After the treatment no symptoms of any sort were noticed, and the temperature remained normal throughout. The agglutination reactions stood at 1 in 540 and 1 in 1280 respectively. Hæmoculture was negative in all the cases and the control showed a negative serum reaction up to six weeks after infection. Six weeks after infection the goats were killed and the results shown in Table III. were noted on post-mortem examination.

TABLE III.

Goat.	Liver.	Mes. gland.	Spleen.	Kidney.	Mamma.	Ing. gland.
1	—	—	+	—	+	+
2	—	—	—	—	—	—
Control ..	—	—	+	—	+	+++

Result.—One goat successfully resisted infection.

Results.

Subsidiary to the main question but of fundamental importance is the observation that the serum reaction remained persistently negative in two of the controls, in spite of a very heavy infection revealed post mortem. Hitherto the existence of the serum reaction has been considered as an index of infection and its absence the proof of normality, but our observations throw considerable doubt on its reliability when used as a test for the detection of infected animals. This point is sufficiently important to demand fuller investigation.

Reviewing our results as a whole, it is clear that we have not achieved complete and effective immunity, and at the same time it is evident that we conferred a certain measure of protection in what is normally a very susceptible animal. If we disregard goat No. 6, on the grounds of natural infection before purchase, we can say that: (1) *B. melitensis* was not found in the mammæ or in the milk of any of the treated goats, while it was present in the milk of the first control and in the mammæ of the other two. (2) In four out of twelve treated goats there was no sign of infection. (3) In the remaining eight the infection was mild as compared with that of the controls, in that only a few colonies of *melitensis* were obtained, whereas most of the plates made from the controls were crowded. (4) *B. abortus* employed as antigen appears to be as effective as *B. melitensis*.

We believe that, with certain modifications in technique, cutaneous vaccination can be rendered more effective and that we have obtained enough prima facie evidence to justify a continuation of our experiments, which are only preliminary.

Clinical and Laboratory Notes.

TWO YEARS' EXPERIENCE OF THE KAHN REACTION.

BY D. S. MURRAY, B.SC., M.B. GLASG.,
PATHOLOGIST, LAMBETH HOSPITAL, LONDON.

WHEN in 1927 it became obvious, from the increasing number of reports appearing, that the Kahn reaction for the diagnosis of syphilis was gaining ground, it was decided to try the method at this hospital. For a few months a preliminary test was done, and as the results were favourable it was decided to employ the reaction as a routine on all sera sent for Wassermann. Kahn's technique has been followed as closely as possible, while the Wassermanns have been done by C. H. Browning's method which has given very consistent results when checked against the results obtained at another laboratory using a method recognised by the Ministry of Health, where most of our Wassermann tests are duplicated. The results given here do not include tests done in the preliminary trial of the method.

In the period covered, 3823 sera have been tested by both methods, and Table I. shows the degree of agreement reached.

TABLE I.

—	Absolute agreement.	Relative agreement.	Absolute disagreement.
Total and percentage	3534 (92·42)	146 (3·83)	143 (3·74)

Table II. shows what has been taken as absolute and relative agreement.

TABLE II.

—	Absolute agreement.				Relative agreement.				Absolute disagreement.			
Wassermann	++	+	+−	−	++	+	+−	−	++	+	+−	−
Kahn ..	++ ++	++	+	−	++	++ ++	−	+−	+ or −		++ ++	or + −

The figure for absolute disagreement is very close to that reported by other workers, but further considerations allow of improvement even on this. Among the 143 sera showing absolute disagreement are 51 "repeats." Removing these from the Table—i.e., considering only results of single tests on single

TABLE III.

—	—	Absolute agreement.	Relative agreement.	Absolute disagreement.
Antenatal cases.	Total and percentage	780 (96·3)	16 (2·0)	14 (1·7)
New-born infants.	Total and percentage	591 (98·5)	3 (0·5)	6 (1·0)

patients—the absolute disagreement is only 2·43 per cent. Removal of the treated cases would still further lower this figure. It is our experience that

the Kahn test remains positive after the Wassermann has become negative in a large number of cases. The actual degree of disagreement between the two methods is probably best shown by Table III., which gives the figures for the antenatal clinic and new-born infants.

Here we are dealing with 1400 sera taken as a routine, without selection and without any clinical suggestion of syphilis.

When the agreement between the tests is relative, we have found the Kahn to be stronger in 60 per cent. of cases, but in those entirely disagreeing the Kahn is stronger in 95 per cent. of tests. This agrees with the finding that in treated cases the Kahn remains positive longer than the Wassermann. It is difficult to make a complete analysis of all the tests which disagreed and to correlate them with the clinical findings, but we have definitely found the Kahn of great value in such cases as the following :—

CASE 1.—A male, aged 24 years, was seen with a primary sore. *Spirochæta pallida* was identified in the smears. The Wassermann was negative, but the Kahn strong positive. The Wassermann has never been positive ; the Kahn is now negative after treatment.

CASE 2.—A new-born infant. Blood from the cord gave a negative Wassermann and a strongly positive Kahn. The mother's blood gave a positive Wassermann and a strongly positive Kahn.

CASE 3.—A female, aged 53, was admitted with a diagnosis of tabes dorsalis. The blood—Wassermann was suspicious and the Kahn a strong positive. The cerebro-spinal fluid gave a strongly positive Wassermann.

The Kahn test has now taken its place among our routine examinations and is done on all sera sent for Wassermann. It does not take long to do, and, though it requires care and practice in reading the results, its value has been proved. There is no intention of replacing the Wassermann, but the Kahn is definitely considered a useful addition to the older test.

A FATAL CASE OF DIPHTHERIA WITH CEREBRAL THROMBOSIS.

BY J. B. ELLISON, M.B. CAMB., D.P.H.,
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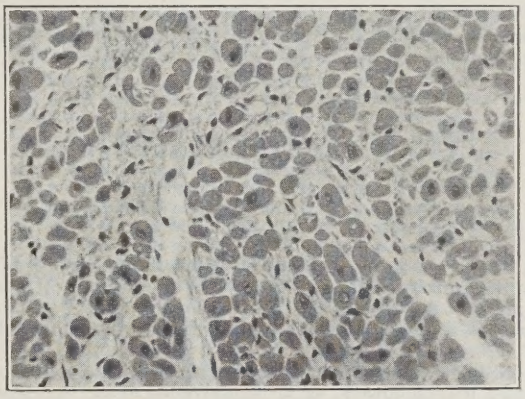
ALTHOUGH toxin is damaging to the whole vascular system, intracerebral catastrophes appear to be very rare during the course of clinical diphtheria. J. D. Rolleston (1916) has published 96 cases from the world's literature, with an account of 18 post-mortem examinations, but I am unable to discover any record of such a case since 1916. The 18 recorded necropsies revealed cerebral embolism 13 times, cerebral thrombosis three times, hæmorrhage once, and "sclerotic atrophy" once. Owing to the unusual character of the clinical and pathological findings, the following case appears worthy of record, although a satisfactory explanation of the disaster is wanting.

On Nov. 23rd, 1929, a boy aged 6½ was admitted to the Grove Hospital suffering from severe faucial diphtheria. There was a previous history of measles, whooping-cough, and chicken-pox. On admission a thick membrane was observed covering the tonsils and the pillars of the fauces, with a slight extension on to the soft palate, and there was some œdema of the neck. The first sound of the heart was softened at the apex and the pulse-rate was 132. The child had apparently been ailing for about two days before admission. An intramuscular injection of 32,000 units of antitoxin was given. Next day the membrane showed signs of separating, but a further injection of 24,000 units of antitoxin was given subcutaneously. The heart was not dilated and the pulse was of good volume, with a steady rate of 110. Two days later the membrane had completely separated and the patient appeared to be making very good progress.

On Dec. 1st he vomited and the pulse became irregular (ninth day since admission). Adrenalin ℥v. four-hourly was ordered, and the foot of the bed was raised. Next day the pulse had improved in volume and steadiness, the heart sounds were normal, and there was no further vomiting, but on the following day, although the pulse showed further improvement, early paralysis of the palate was detected. The first sound of the heart was softened and slightly prolonged at the apex. At 8 P.M. on Dec. 5th the nurse in charge reported that the patient had suffered a "convulsion," with moaning and grinding of the teeth, lasting about five minutes, after which he appeared to be paralysed on the right side. When seen at 8.10 P.M. flaccid paralysis of the right arm, leg, and right side of the face was noted. The patient was conscious ; he could swallow and protrude the tongue, but was unable to speak. The limb jerks and abdominal reflexes were absent on the right side, and a right extensor plantar response was elicited. The inability to speak was apparently the result of total motor aphasia which made it difficult to decide whether there was any loss of sensation on the affected side. The pupils were equal and reacted to light and accommodation. There was no nuchal rigidity. The pulse remained steady at a rate of 80 and was regular.

On Dec. 6th spasticity of the right arm was present and the knee-jerk had returned on the right side. Complete aphasia was still present. A diagnostic lumbar puncture was performed, revealing a fluid of normal composition with one cell per cubic millimetre. The pulse remained steady and of good volume. On Dec. 8th increasing spasticity of the right arm and leg was observed, while the facial weakness



Section of myocardium.

was much less obvious. The patient appeared to be in pain but was unable to articulate any word. At 9 P.M. he was reported to have had another "convulsion" lasting a few minutes, accompanied by moaning and grinding of the teeth. When seen a few minutes later he was unconscious with conjugate deviation of head and eyes to the right. The pupils were equal and widely dilated, but reacted to light. Cheyne-Stokes respiration was noted. Physical examination revealed spasticity of the left arm and leg with brisk knee and ankle-jerks, and patellar clonus. There was now a double extensor response. The optic discs were injected and the retinal vessels appeared to be dilated. The patient became gradually weaker and died at 12.20 A.M., without regaining consciousness. The pulse remained of good volume until near the end.

Post-mortem Examination.

The body was that of a normally developed boy of about 6 years. The brain was uniformly softened (examined four days after death). The convolutions were not flattened, and there was no excess of cerebro-spinal fluid. Examination of the circle of Willis revealed thrombi completely occluding the main trunks of both middle cerebral arteries. On each side the thrombosis appeared to have begun at the first bifurcation and to have extended peripherally into all the smaller branches. The thrombus on the left side appeared older than that on the right and showed early organisation. Macroscopically the cerebral arteries appeared quite healthy and were well developed.

A microscopic section of the thrombosed vessels showed, on the left side, a thrombus about two days old in which polymorphonuclear leucocytes could be seen breaking down hæmoglobin. The right artery showed thrombosis of very recent origin, probably only a few hours. There was no evidence of any disease or malformation of the vessel walls. The brain showed softening of the white matter, atrophy of nerve-cells, and numerous capillary thromboses. The meninges were healthy. (The site of the thromboses is shown in the Figure.

Heart.—The heart was flabby and dilated, but the valves and mural endocardium appeared perfectly healthy. The condition of the myocardium was especially interesting because there seems little doubt that, but for the vascular crises, the patient would have recovered completely.

Clinically his heart appeared to be improving steadily from the tenth to the fifteenth day. Microscopic section revealed marked toxic changes in the muscle-fibres; they were separated from one another and irregular in outline. The protoplasm was granular and vacuolated, while in many fibres the nuclei had completely disappeared and in others they stained but faintly and were in course of disintegration, in others again being considerably diminished in size. There was no increase in connective tissue. (See Figure.) The aorta and pulmonary arteries were quite healthy.

The remaining organs showed the usual toxic changes associated with acute diphtheria.

No cause for the thrombosis can be suggested; the condition was definitely not produced by emboli. The patient had no reaction after the injections of antitoxin, but thrombosis can scarcely be regarded as an anaphylactic phenomenon. Perhaps it is worth while to mention that two of the patient's grand-parents were stated to have died of "apoplexy." The parents are living and healthy.

As in all other recorded cases, there was a severe infection of the myocardium and a large amount of membrane on the fauces.

I am indebted to Dr. J. H. Whitaker, medical superintendent of the Grove Hospital, for permission to publish the notes on this case.

A CASE OF ACUTE SYPHILITIC MENINGITIS.

BY N. KRAMER, M.R.C.S. ENG.,
HOUSE PHYSICIAN, ST. JOHN'S HOSPITAL, LEWISHAM.

A MAN, aged 24, presented himself at St. John's Hospital on July 6th, 1929, with a chancre on the prepuce, stated to have been there 14 days. The *Treponema pallidum* was demonstrated by the dark field.

Treatment was begun at once, beginning with a course of mercury pills followed by neokharsivan. After the fifth injection on Sept. 13th the patient gave up attending. Five weeks later he developed severe headache and giddiness and this continued for a fortnight.

On Oct. 29th he was admitted to St. Thomas's Hospital. The following account is taken from the notes kindly forwarded from there. On examination there was slight bilateral papilloedema and paralysis of the left seventh and eighth nerves. The blood Wassermann was positive (+ +). The cerebro-spinal fluid contained 1500 cells per c.mm., and 98 per cent. of them were lymphocytes. There was a gross excess of globulin. The cerebro-spinal Wassermann was very strongly positive (+ + + +). Treatment was by a course of 12 mercury inunctions, six injections of 0·3 g. of novarsenobenzol, and one injection of stabilarsan. He was discharged on Nov. 21st, 1929, feeling quite well, and showing no abnormal physical signs.

On Nov. 26th he attended the clinic at St. John's Hospital. He was treated by a course of mercury pills and potassium iodide. The blood Wassermann on Nov. 26th was + +, and the Vernes 79. On Jan. 14th the blood Wassermann was + + and the Vernes 39. Very soon after this he developed severe headache, giddiness, and diplopia. On Jan. 30th he was admitted to St. John's Hospital. He was semi-comatose, was delirious at times, and showed marked hyperæsthesia. All reflexes were very brisk, and the plantar responses were flexor. The pupils showed no abnormality and the discs were normal. Of the cranial nerves only the right facial was affected. The cerebro-spinal fluid was under pressure and slightly turbid and contained 790 cells per c.mm.; the majority were lymphocytes. There was a gross excess of globulin. The cerebro-spinal fluid Vernes was 94·5. The patient was treated by one injection of 0·3 g. of neokharsivan, followed by a course of intramuscular injections of mercury cyanide 1 c.cm. (½ g.) twice weekly for eight injections. This was followed by three injections of bismogenol: 0·5 c.cm., 1 c.cm., 1·5 c.cm., at intervals of four days.

Shortly after admission the patient's condition greatly improved and four days later he was quite well and showed no abnormal physical signs. He was discharged five weeks later on March 11th. The cerebro-spinal fluid then was clear and contained 80 cells per c.mm., most of them being lymphocytes. The cerebro-spinal fluid and blood Wassermann was + +.

The case presents some very unusual features. In spite of the fact that treatment was started as soon as the chancre was found, meningitis developed after four months, and again, although treatment was continued uninterruptedly, a second attack of meningitis occurred within three months of the first one. At the time of writing the patient is quite well and carrying on his occupation.

I am indebted to Dr. H. M. M. Woodward for permission to publish these notes.

Medical Societies.

POOR-LAW MEDICAL OFFICERS' ASSOCIATION.

THE annual general meeting of this Association, the last meeting under its old name, was held at the Holborn Restaurant on June 12th, with Sir ARTHUR NEWSHOLME, the President, in the chair. Prof. MAJOR GREENWOOD opened a discussion on

POST-GRADUATE EDUCATION FOR THE LOCAL GOVERNMENT MEDICAL SERVICE.

Medical education, he said, was of two totally different kinds. The first was education in the pure sense, such as Macaulay had in mind when he said that if Cherokee were taught instead of Greek in our universities the students who wrote the best Cherokee verses and understood the use of Cherokee particles best would be the best men. The second was education in the sense of technical instruction, to secure that the tyro should learn how to perform certain skilled manipulations in the best possible way. A century ago medical education in the hospitals had been almost entirely technical. The idea of general scientific education had been in its early stages about 50 years ago, and 30 years ago the transition had become complete, physiology and anatomy being taught by pure specialists. Post-graduate education had been represented by the Diploma of Public Health, which conferred a definite legal status, and the Fellowship of the Royal College of Surgeons and the Membership of the Royal College of Physicians, which in practice had the same effect. These two latter qualifications showed clearly the mixture of the two notions of education. For the Membership of the Royal College of Physicians candidates were examined in the classical languages; the examination had been somewhat perfunctory, and it had been discontinued as a compulsory test six years ago; the conception nevertheless had been that a certain breadth of culture was desirable in a physician. The Royal College of Surgeons had maintained that point of view even more strongly; the teaching and examination in physiology, for example, were supposed to have had a definite cultural value, lectures having been given on parts of the physiology of the special sense organs and similar subjects of remote technical but considerable cultural value.

It was interesting, said Prof. Greenwood, to examine the attitude of the authorities to the youngest of these special diplomas, the Diploma of Public Health. The first rules issued by the General Medical Council in 1896 had begun by stating that the possession of a distinctly high proficiency, scientific and practical, in all the branches of study which concerned the public health should be a requisite of any diploma that the Council would register. According to the German proverb, however, "*Es wird nicht so heiss gegessen als es gekocht ist*," and the practical embodiment of that high principle of the General Medical Council was the requirement of six months' practical instruction in a laboratory or laboratories in which were taught chemistry, bacteriology, and the pathology of the diseases of animals transmissible to man. The requirements for instruction in the duties of a

medical officer of health left very considerable latitude to the examining and teaching bodies; it was mainly valuable on the technical side. The general scientific value of the teaching in bacteriology and chemistry was altogether subordinate, and the public health students were often not regarded with very serious interest by the teachers of these subjects. Thirty years ago, therefore, the course prescribed by the Council had been largely a matter of indifference, and the men who had entered the public health services had been men who had seen a vision, who had wished to pursue a certain ideal; men like Power, Shirley Murphy, and the President of this Association. The material rewards had been so trivial that only a real enthusiast would enter the service. It was no stigma on the younger generation to say that its average level was lower than that of 30 years ago. Owing to the splendid success of the work of those men the public health service had been enormously extended, and now offered a career for a large number of young medical men.

Increase in Technical Training.

In 1922 the General Medical Council had promulgated a new series of rules which had had roughly the effect of making the attainment of a diploma in public health considerably more difficult. The rules of 1896 had merely required that 12 months should elapse since qualification. The new requirements laid down that:—

"A period of not less than two years shall elapse between the attainment by a candidate of a registrable qualification in Medicine, Surgery, and Midwifery and his admission to the Final Examination for a Diploma or Degree in Sanitary Science, Public Health or State Medicine."

The Council had explained its reasons—perhaps a fault in legislators—for this legislation:—

"The purpose . . . . is to provide opportunity for candidates for the Diploma or Degree in Sanitary Science, Public Health, or State Medicine to pass from the state of pupilage to that of responsible practitioners, to give mature consideration to the obligations and duties involved in the work of the public health service, and to acquire direct experience of medical work in a responsible capacity either in practice or in hospital or laboratory appointments. The Council believe that, in the public interest, the time has arrived to adapt the diploma or degree to candidates who are seriously intending to take up public health work as a career."

The Council had next set down in much greater detail than before the subjects which they considered should be studied by candidates for the Diploma in Public Health. In the old days a complete ignorance of, for example, vital statistics would never have deprived a candidate in this country of a single mark. The latest orders of the Council, besides repeating the old requirements in bacteriology, chemistry and physics, laid down the minimum number of hours which should be devoted to these subjects. It required a minimum of 180 hours' study of bacteriology and parasitology, not less than 150 hours being occupied in practical laboratory work; it prescribed a minimum of 90 hours' work in chemistry and physics, and of 10 hours in meteorology and climatology in relation to public health. Epidemiology and vital statistics must be allotted at least 20 hours, and sanitary law and administration another 20 hours. Provision had been made in London for the teaching of students in the new School of Hygiene and Tropical Medicine, which had been equipped at great expense and had a full-time staff.

Practical Difficulties.

The problem was how far it was possible to turn out students who were really better trained than their fathers or grandfathers had been. The first difficulty was the mixture in medical education of technical and general training. A specialist criticising this schema would say that it was utterly impossible to turn out highly trained technicians in the time allotted to each technical subject. The time was too long for a more popular introduction to the subject and too short to produce real technical skill. The practical difficulty encountered by the teacher of public health students was that the whole point of view of undergraduate medical training was necessarily and rightly utterly different from the point of view of an epidemiologist. The clinician was concerned with relieving and curing the sickness of individuals; the epidemiologist with disease as a mass phenomenon. It was enormously difficult in dealing with young medical graduates to prevent them from either adopting dogma or from passing over into a state of ignorant scepticism. The young medical graduate had had a large amount of technical education, but when presented with a general argument was often as helpless as a child. In public health work the most certainly ascertained results were based on a balance of probability. A conclusion with respect to the importance of contamination of water-supplies in the history of typhoid that anybody considering the evidence as a whole would accept, was never based on a conclusive proof in the sense of a crucial experiment. Sometimes the balance hung still more doubtfully, and it was of the utmost importance that the young graduate who was going in for public health work should acquire some skill in the weighing of probabilities. The amount of time at the disposal of teachers was so short and the technical requirements so great that there was a real danger that a university school might degenerate into a mere institution for cramming students with selected wads of technical information. There was one safeguard: that the student was examined by his own teachers on the teaching actually given in the school, but the teaching had to conform to the rules of the General Medical Council. Some parts of the curriculum were given much more time than the minimum. So long, however, as students were stretched out on this procrustean bed there was a danger of producing young men with merely a certain smattering of technical knowledge. Prof. Greenwood submitted that there was a certain amount of English hypocrisy about the system—a pretence that things were different from what they really were—and he suggested that the pretence that it was possible to turn out highly trained technicians after even a year's course was a little dangerous. He asked whether it might not be better to admit frankly that parts of the course, so far as they had a value, were valuable in the general educational sense. The students who could acquire the scientific spirit from a course of epidemiology and vital statistics were probably going to be mere breakers of apparatus in a bacteriological laboratory. On the other hand, some men to whom statistics and the doctrine of Hippocrates were mere sound and fury might obtain a glimpse of the spirit of science in a laboratory. It would probably be better, he suggested, to pitch a very low general minimum of technical requirement; and then give students a choice of the subjects on which they must spend extra time, and to require a higher standard of those subjects.

The tendency to increase technical instruction in post-graduate and undergraduate medical education might be a necessary evil, but it was a great one. Prof. Greenwood suggested that the physiology taught 30 years ago had had greater educational value than that taught to-day; the increase of knowledge and the complication of method was so great that it would be impossible, even if the teacher had far more time, to make the student understand the general principles of the investigations which now led to results. He suggested, first, that young graduates were less educated than their predecessors of 30 years ago, although they had more knowledge, and, secondly, that the higher level of general culture on which the Royal Colleges had insisted was really required in men who were going to give their lives to the public health service. The prizes of the public health service could not compare with those of the clinical side of the profession, and the type of students likely to be attracted was composed of men who, if they had been laymen, would have tried to enter the Civil Service—who wanted something

safe. A great many men of the highest type with a real vocation would undoubtedly join the service, but it would not attract the pick of the ambitious undergraduates. Teachers had to try to repair the deficiencies in their students' education, and the very overburdened technical course might make this task somewhat difficult.

Discussion.

The PRESIDENT thought that Prof. Greenwood was unduly sceptical about the average capacity of aspirants for the public health service. He agreed that the requirements of the General Medical Council erred somewhat on the side of standardisation, but admitted the arguments in favour of a minimum standard, even if the minimum were not an adequate one. Many of Prof. Greenwood's criticisms, he said, would apply equally well to the ordinary medical course. The medical student could not hope to be equally proficient in all the subjects he was taught, but if he had no knowledge of them at all he would be correspondingly inadequate and unsatisfactory. The future medical officer of health must have a fairly complete syllabus. He was the general practitioner in preventive medicine. Sir Arthur looked forward to the day when the public and the private health services would be identical, when the general practitioner would be the medical officer of health for the families of whom he had charge, and the medical officer of health would play a minor part. He wished that the General Medical Council had included in its syllabus the practical training which every would-be medical officer of health ought to receive; which corresponded to the hospital work of the medical student. He had nearly always, when he was a medical officer of health, had a young man attached to him without a salary, who had sat at his elbow, gone on his visits with him, and assisted him with his office work and reports. Men who had had this experience were better trained than those who had not. The difficulty was that, although general culture was desirable, the public health practitioner had to be trained all round as a preliminary to his specialised training. He regretted that general practitioners and public health men alike knew so little of the science of social relations—of the questions of public morality and pauperism in relation to public health. This knowledge had a science attached to it, and was perhaps more important in the present complicated condition of social affairs than even vital statistics.

Dr. A. E. COPE said that the present-day "technicalitis" was only part of a much wider movement. The system of allowing candidates to choose their subjects had many advantages, but had the danger of increasing the formation of ruts in the minds of young people and developing technical at the expense of general education. The problem of post-graduate education was a hard one for the general practitioner, who found it difficult to leave his work and who sometimes, when he had left it, encountered restrictions and conditions which were very difficult to comply with. He often did not wish to take the full course, but to follow a limited bent. The London School of Hygiene and Tropical Medicine should make some provision on the lines of the University extension lectures, so that the general practitioner could refresh his knowledge where he needed it, and become familiar with the subjects which were most important.

Dr. C. E. MCDADE pleaded that teachers should be entrusted with examining boards and allowed to allot a certain number of marks for proficiency before the student went up for examination at all. The ideal was that each man should develop along the lines that suited him best.

Mr. ZACHARY COPE was thankful that there were no internal examinations on the medical side. The system was not only wasteful, but candidates were apt to do badly when examined by their own teachers. Public health should not be discussed apart from private health; the two were identical. He foresaw the time when all branches of medicine would be coördinated into a single service—not a State medical service but one which offered plenty of scope for private enterprise. The medical school and the public health school could do no more than cast the student into a certain mould, upon which his specialisation would depend. There must be a modicum of instruction. Dr. Johnson had said that the average man could always get a living at medicine. As the average man was pretty dull, the modicum must be fairly low. There was a great opportunity in the future for the municipal hospitals, with adequate organisation and coördination, to give practical instruction to the newly qualified. He hoped that the examination for the Fellowship of the Royal College of Surgeons would in future require that the candidate should have had practical experience.

Dr. WILLIAM SHACKLETON suggested that a man who had made a personal study of certain individual trees and their habits and growth might take a very good view of forestry. Perhaps a vision of the whole subject of medicine followed on the study of individuals.

Dr. JAMES BUCHANAN welcomed the new Diploma of Gynæcology and Obstetrics; this subject was the basis of general practice. Post-graduate courses on ophthalmology and diseases of the ear, nose, and throat would also be of great use. Moreover, the average general practitioner knew very little about skin diseases.

Dr. T. B. HAIG mentioned that general practitioners sometimes complained that the welfare officer took away their babies from their charge; the President suggested that they should learn more about welfare work.

Reply.

Prof. GREENWOOD assured the meeting that the students who sought instruction were not by any means to be despised, but were average men. The average men were those whom a competent teacher should seek to instruct, he should not concentrate upon the best students. Minor sicknesses, especially minor mental disorders, were much more important than cancer and tuberculosis; the London School of Hygiene was acting with great foresight in giving courses on the minor psychoses. The School was also trying to provide special courses to meet the individual needs of graduates. He thought the student was as likely to be tongue-tied before external examiners as before his own teachers. It was possible that the public had been encouraged overmuch to demand a long array of diplomas; the profession should set its face against this multiplication.

At the meeting the name of the Association was changed by resolution to the "Association of Local Government Medical Officers of England and Wales."

ROYAL SOCIETY OF MEDICINE.

SECTION OF OPHTHALMOLOGY.

AT a meeting of this Section on June 13th, with Mr. CYRIL H. WALKER, the President, in the chair, a paper entitled

AN EXPERIMENT IN KERATOPLASTY

was read by Mr. J. W. TUDOR THOMAS. He said that at the end of four years of experimental work in efforts to carry out transplantation on rabbits' corneæ the results he had achieved were so poor that it seemed hopeless to expect to obtain transparent grafts, such as in fact he later secured. These latter he had demonstrated at the annual congress of the Ophthalmological Society. The purpose of the experiment now described was to ascertain whether the retention of a very minute pedicle of corneal tissue would suffice to enable the graft to maintain its transparency. He made a rectangular incision into the cornea of a rabbit, penetrating the whole corneal thickness but retaining a pedicle, 2 mm. thick, at the postero-superior cornea. The rectangle

measured 7·5 × 4 mm., and the incision was across the centre of the cornea. Four stitches secured the flap in position. There was good union of the flap, and, with the exception of a marginal scar, the flap later became transparent. It was in this way shown that the keeping of a small pedicle enabled the graft to maintain its transparency. Though there was only 2 mm. width of pedicle, it sufficed to retain life in the graft and without loss of transparency. The graft was cloudy for a week after the operation, and at the end of a fortnight was still slightly cloudy. After three weeks it had become sensitive to touch over an area embraced from the 2 mm. pedicle to the posterior 2·5 mm. of the inferior margin. At this time the graft was clear in the sensitive area and somewhat beyond it, the rest being only slightly cloudy. At the end of a month it was clear except in the case of the marginal scar. In 13 weeks from the date of the operation sensation was normal all over the scar, except for about one square millimetre near the middle of the anterior end. Twenty-eight months after the operation the animal was killed, and microscopical examination of the sections showed that in general the graft was a little thicker than the remainder of the cornea, and that Descemet's membrane was at least as thick as the normal membrane; also it stained a little deeper. In the main graft there was no appreciable increase in the number of nuclei, but at the opaque margins of the graft the following changes were evident:—

The epithelium was thickened; there were six layers of cells, the basal ones being elongated. In this region the stroma contained twice as many nuclei, and there were numerous spindle-shaped spaces between the fibres. Between the free end of Descemet's membrane in the substance of the cornea and the posterior membrane the tissue fibres were coarser and more numerous; some iris pigment could be seen at the site of the anterior synechiæ, and the pigmented cells were covered by a layer of endothelial cells with a new Descemet's membrane. But a minute split was discovered between the two layers of Descemet's membrane; in places this split could be seen to extend throughout the whole breadth of the graft. A small detached portion of Descemet's membrane could be seen curled up in the region of the scar near the posterior surface, but covered posteriorly by the new membrane. This showed that detached portions of Descemet's membrane were but little altered in the course of years.

The appearances of Descemet's membrane in this case, said Mr. Thomas, agreed with the observations of others as to the healing of corneal wounds—namely, that the cut ends of the membrane did not unite, but were joined by the new membrane which was formed, either to unite the cut ends or to fuse with the posterior surface. In this case a new membrane had been formed, which passed quite across the graft and fused almost completely with the graft's original Descemet's membrane. It seemed clear that the marginal portion of the new membrane must have been formed by the endothelial cells of the surrounding cornea. The specimen showed that a new membrane could be formed under such conditions as obtained in this experiment, and over quite a large area, and that it actually covered and fused with the membrane of the graft. It did not accord with the view expressed by Weinstein that the new membrane was composed of differentiated corneal lamellæ. The experiment showed that retention of even a small pedicle of corneal tissue was a material help in revitalising the graft. His experimental experience had been that if a small pedicle had not been retained, even the same method of stitching as in the present case would have produced an opaque graft, and if the present graft had been left without stitches to secure it, the eye would probably have been useless, or at best there would have been a staphylomatous cornea.

With a clean perforating wound of the human cornea it was possible that corneal suturing might again give the patient a useful eye when a pad-and-bandage application might result in adhesion of the iris with a gaping wound, so that the eye must be removed. Such an accident as a penetrating wound of the cornea might occur in a man's only good eye, and if this grafting could be done without the risk of sympathetic trouble supervening, it seemed very desirable to try it. A large corneal wound tended to gape, the anterior chamber did not re-form, the iris became extensively adherent to the wound, and there was real risk of infection.

Discussion.

The PRESIDENT said he thought the eventual result of this fine and laborious piece of work would be great.

Mr. HUMPHREY NEAME pointed out that a section shown by Mr. Thomas in which a portion of Descemet's membrane was reduplicated was reminiscent of the sections seen in old interstitial keratitis. He had had such specimens to examine, either because of the supervention of glaucoma or because a blind eye had ruptured. Sections of such eyes showed a very thick new formation of fibrous tissue behind the remains of the old cornea, and the obviously ruptured Descemet's membrane was curled up in the same manner, and lying at the middle depth of the existing cornea. The new fibrous tissue was fixed and was most obvious in the lower part of the cornea, but in a much inflamed eye there was considerable formation of cellular material in the anterior chamber which accumulated in the lower part.

Mr. J. H. FISHER said it did not strike him that in the case described by Mr. Tudor Thomas the endothelium had spread in from the periphery to cover the posterior surface of the graft and secrete a new deposit of hyaline material. Apparently all the other tissues of the graft had survived well, and he saw no reason why the endothelial cells, in such an experiment, should not also retain their vitality. It was not, he thought, an ingrowing of epithelial cells from the periphery, but a survival of the cells on the deep surface of the graft, which, under the conditions of excessive activity, had produced a second layer.

Mr. MAURICE WHITING thought the value of Mr. Tudor Thomas's experiment lay in the possibility of usefully repairing wounds of the cornea. But when a cornea was wounded in actual life, the conditions differed from those in a laboratory experiment; the wound was caused by a relatively blunt instrument and so a good deal of injury was sustained by the cornea, and infection was very likely to supervene. During the late war he had several times tried to preserve a wounded cornea by means of a flap, but the attempted suture under those conditions in order to secure the wound edges usually resulted in even greater damage; therefore he fell back on the simpler pad and bandage to keep the flap in position. Conjunctival flaps he judged to be unsuitable under war conditions.

Mr. F. JULER commented on the fact that Mr. Tudor Thomas seemed to use a suture for each lip of the wound.

Lieut.-Colonel A. E. J. LISTER spoke of two cases of corneal wound in which conjunctival flaps were successful.

Mr. TUDOR THOMAS, in reply, said he did not know whether endothelium survived in the cornea, but probably it did. He agreed that wounds of the cornea in actual life were usually caused by a blunt instrument and were liable to infection, but even so, for a plain incised wound, suturing might be useful. In a clean wound, an edge-to-edge corneal suture was best. Animals, he found, tolerated corneal stitches very well provided they were not inserted right through the cornea.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.

CYCLOTHYMIA IN GENERAL PRACTICE.

AT a meeting held on June 5th, Dr. W. BARRINGTON PROWSE, the President, being in the chair, Dr. HELEN BOYLE read a paper on the Milder Forms of Manic-

depressive Insanity and Cyclothymia in General Practice. The term manic-depressive, she said, was of Kraepelin's classification and embraced, according to its author, a vast variety of conditions from acute mania to marked alteration of mood in the sane. She made a plea for several subdivisions under the heading manic-depressive, and called attention to the association between some manic-depressive states and thyroid disturbances (hyper-, hypo-, and possibly dysthyroidism), and also to a group associated with hyperpiesis, arterio-sclerosis, morbid intestinal states, and kidney trouble. Real progress could only be assured in the treatment of these cases by close coöperation between the general practitioners (who saw and treated all the early cases) on the one hand, and those specially interested in neuro-psychiatry on the other. This aim was now being pursued, and mental medicine, which had for long been crying in a wilderness inhabited by witches, spiritualists, criminals, and others, was being welcomed back into the fold of general medicine. This was especially desirable in connexion wth manic-depressive insanity in which the patients often have long periods of normality and of capacity for carrying out valuable work. In Kraepelin's classification manic-depressive insanity covered a wide field—including the whole domain of so-called periodic and circular insanity, simple mania, the greater part of the morbid states termed melancholia, a not inconsiderable number of cases of amentia (confusional or delirious insanity), and certain very slight colourings of mood. People liable to marked variations of mood were familiar to all, and all had suffered at times and at times rejoiced and benefited by the feverish energy, optimism, joy of life, and determination to put things through of cyclothymics. They were, in moderation, invaluable to the community. In their euphoric stages, short of insanity, they were sublimely self-confident, and superbly devoid of self-criticism and inhibitions, and by that temper which could feel no difficulties fine feats could be achieved. Cyclothymia, which signified a nervous or mental illness which showed a cyclic tendency, was a useful term to apply to the occurrence of mild manic-depressive states in patients who were not insane and very possibly never became so. Few would object to being called cyclothymic while many objected to manic-depressive as a description of their condition. After quotations from various authors showing the similarity between the hyper- and hypo-thyroidic illness and manic-depressive states, Dr. Boyle pointed out that in some of the latter there was a history of enlargement of the thyroid during adolescence, sometimes accompanied by cyclothymic tendencies. It would be of great value if practitioners would take note of this condition in schools or private practice and confirm or disprove the observation that it was a forerunner of cylcothymia in adult life. The treatment or neglect of adolescent thyroid enlargement would have to be modified, for it could hardly be doubted that the young persons suffering from this enlargement should be removed from competitive work or play of all kinds with its accompanying strain of anxiety.

The other group of manic-depressives, associated with a hyperpiesis which might show itself in early adult life, had one clear indication for treatment. The blood pressure, even when considerable, should only be reduced with great care ; steam baths, colon douches, and other eliminative measures could be used. The high pressure was required for efficient excretion, and unless this was secured by other means an attack of insanity supervenes. In these patients 185 to 190 was usually the lowest limit of safety. One patient, after several severe attacks of insanity at fairly regular intervals for which she had to be certified, subsequently went through the rest of her life (some 10 to 15 years) without another attack. These patients in later life showed confusion and disorientation in their attacks. Even these attacks, if the blood pressure went up and elimination was successful, might clear up in 24 hours.

Reviews and Notices of Books.

RADIUM IN GENERAL PRACTICE.

By A. JAMES LARKIN, B.Sc., M.D., D.N.B., Radium Consultant on Staff of Wesley Memorial and other Hospitals; Instructor in Dermatology (Radium), Northwestern University Medical College. New York: Paul B. Hoeber; London: Humphrey Milford, Oxford University Press. 1929. Pp. 304. 27*s*.

THIS book is written for the practitioner and is commendably simple. It is, moreover, well adapted to its purpose, for it indicates clearly the cases in which he will and will not find radium therapy of service. It does not pretend to give the knowledge that will make him an expert in the technique, but it fulfils the author's intention of giving a quick reference to the therapeutic possibilities of radium in any particular type of case. The essentials of the mechanics and physics of radium are condensed into the first 16 pages, and the whole of the rest of the book is devoted to a detailed consideration of the treatment and probable reaction of the various pathological conditions that are influenced by radiation therapy. These are considered under four headings: (1) general diseases, which include the blood and ductless gland conditions; (2) gynæcological diseases; (3) miscellaneous tumours; (4) miscellaneous skin lesions. A list of about 70 simple and malignant types of disease are given separate consideration. An outline of the pathology, radium indications, prognosis, a typical condensed case-history, and a bibliography are given for each lesion. In this way the author places at the disposal of the practitioner a summary of the most important information available on the particular disease in which he happens to be interested. The method calls for repetition under each heading, but this does not matter since the author only touches lightly the salient features and avoids detail. In Dr. Larkin's practice and experience it is evident that the combined effect of X rays and radium has not received much consideration, in spite of the fact that in European clinics they are largely used together in the treatment of malignant disease. We could find only one reference to X rays in the book, and this is to the effect that X rays will only be employed where a sufficient quantity of radium is not available.

The book is, however, an admirable guide for the practitioner who wants to learn which of his cases are likely to be benefited by radium treatment.

DIABETES.

A Diabetic Manual for the Mutual Use of Doctor and Patient. Fourth edition. By ELLIOTT P. JOSLIN, M.D., Clinical Professor of Medicine, Harvard University, Boston, Massachusetts. Philadelphia: Lea and Febiger. Pp. 248. $2.

THIS manual is designed to teach both doctors and patients the elements of the principles which govern the treatment of diabetes mellitus. It is well adapted for this purpose, since the racy descriptions and clear sketches and photographs amply compensate for the author's rather diffuse style of writing. The dangers of the disease are explained with the errors which have caused them, and their treatment is clearly outlined. The directions for dieting are good, the diet tables, although very elaborate, are still drawn up in percentages, leaving the patient to do the calculating. Admittedly the patients or their attendants ought to be able to work out sums by the rule of three, but in practice many prove incapable of so doing. In parts of the book which have been revised, Dr. Joslin has begun to speak of 5 g. equivalents, and it is to be hoped that the next edition will see this change in the diet tables. The new carbohydrate values worked out by McCance and

Lawrence have not been adopted. A great change has been made in the carbohydrate ration. Instead of limiting the carbohydrate to 50 or 60 g., Dr. Joslin has increased it to 100 or even 150 g. This increase, of course, demands an increase in the insulin dosage, in order to maintain the blood-sugar at a normal level. This increase, however, is less than might have been expected. The additional amount of insulin necessary for an increase of carbohydrate of 100 g. is not 50 units, but only 30 or even 25 units. The general condition of the patients is improved on this diet, and the necessity for special diabetic foods disappears. Dr. Joslin adds a warning that it is more difficult for a patient to refrain from taking too much carbohydrate when he is already allowed so much, and draws attention to the well-known difficulty of the alcoholic in limiting himself to moderate amounts of alcohol. However, provided the additions are made cautiously, under medical supervision, with adequate amounts of insulin, this difficulty should not be insuperable. The sections on minor ailments, and especially that on the care of the feet of elderly patients, are especially good. The section on treatment of coma, though adequate for the patient, is hardly full enough for his medical attendant who will have to refer to a bigger manual.

Unbekanntes von Insulin. Von W. FORNET, Oberstabsarzt a.D. München: Verlag der Aerztlichen Rundschau. 1929. Pp. 41.

ALTHOUGH it is true that a great deal still remains to be discovered about insulin, Dr. Fornet has hardly advanced our knowledge. The natural desire, which is shared by all physicians, to be able to recommend as effective the oral administration of insulin has lead Dr. Fornet to examine the evidence in favour of the view that insulin is absorbed from the alimentary tract. Unfortunately, this evidence is presented in a very one-sided manner, and the experiments against the view are mostly ignored. Thus the experiments showing that raw pancreas given by mouth is effective are quoted, but the results of others who refute the claim are not mentioned. Dr. Fornet has endeavoured to prevent the action of pepsin and trypsin on insulin by protecting it with bile. The preparation made on this principle is given in pill form, and good results are claimed for it. The evidence produced, however, does not carry conviction.

SURGERY OF THE GALL-BLADDER.

Das Für und Wider der Chirurgischen Behandlung des Gallenleidens. By Prof. Dr. PAUL ZANDER, Chirurg des Elisabethenstifts in Darmstadt. Leipzig: Georg Thieme. 1930. M.8.50.

THIS is a review of the immediate and later results of 800 operations for disease of the gall-bladder and bile-ducts. The operations included 768 cholecystectomies and only three cholecystostomies. In 138 cases the bile-ducts were also opened, and in 81 some operation upon the stomach was performed as well. The analysis of the cases has been careful, and a number of lessons are to be learnt from the records. Perhaps the most interesting is the fact that among those patients who suffer from colic without stones and without pronounced naked-eye changes in the gall-bladder, only 42 per cent. are cured of their complaint when the gall-bladder is removed. There has been a tendency of late, especially amongst Scottish surgeons, to remove the gall-bladder from patients who have no gross lesion of the organ. Even where evidence of disease can be obtained by microscopic examination or culture of the wall, it seems that adaptation to loss of the gall-bladder when its function has not been gradually destroyed is difficult. There is a 90 per cent. complete recovery-rate in hydrops of the bladder, and a 79 per cent. rate when stones or suppuration confined to this organ are present. The results get worse when infection has spread to the ducts. Obviously, then, early operation is desirable in the presence of infection, but the fact that intervention in conditions where stones are absent and inflammatory changes at a minimum is not very successful must be remembered. It would be interesting to test the effect of cholecystostomy in these patients, and to ascertain whether or not the dye test would enable the surgeon to select those cases likely to benefit from operation. This book gives a fair survey of the surgical treatment of gall-bladder disease, and deserves attention.

ESSENTIALS OF MEDICINE.

Ninth edition, revised. By CHARLES PHILLIPS EMERSON, M.D., Professor of Medicine, Indiana University. London: J. P. Lippincott Company. Pp. xx. + 588. 12*s.* 6*d.*

THE ninth edition of this well-known text-book, designed essentially for junior students and nurses, has been thoroughly revised with the assistance of Miss N. G. Brown, R.N., assistant director of the Indiana University Training School for Nurses. The easily read, narrative style, the general clear presentation of the subject, the well-chosen illustrations, and the detailed table of contents combine to make a useful volume which lay people interested in medicine might also read with advantage.

OXIDATION-REDUCTION POTENTIALS.

By L. MICHAELIS, M.D. Translated by LOUIS B. FLEXNER. London: J. B. Lippincott Company. 1930. Pp. 197. 12*s.* 6*d.*

THE measurement of oxidation-reduction potentials has proved in the hands of Mansfield Clark and his co-workers in Washington so useful in the study of purely chemical oxidation-reduction systems that the results so far obtained by application of the same methods to biological systems are disappointing. The reasons for this are made clear by Prof. Michaelis's admirable analysis of the problem, in which his own fundamental work on the electrode potential of cysteine is presented in a new light. Although his conclusions tend to throw doubt on the value of much of the work, his criticisms are sound and will place the whole subject on a firmer basis. One of his most important contributions concerns the nature of the potential established at an indifferent electrode by sulphydril bodies which are present in all tissues. He shows that in the presence of oxygen the electrode is not indifferent—it is attacked—so that the potential is not a true oxidation-reduction potential. This fact alone obviously places grave restriction on the use of electrodes in the study of living systems. He also points out the fallacy of speaking of the oxidation-reduction potential of a living aerobic system, since the existence of a definite potential implies a true equilibrium which is incompatible with life; we may speak of the potential of the tissue fluid of the culture medium, but not of the potential of the cell or the bacteria. The book has been translated by Louis Flexner, who is well-known for his work in this field. It opens with a complete theoretical discussion, the second part being devoted to physiological applications. Dr. Michaelis's exposition of the limitations as well as the possibilities of the study of oxidation-reduction potentials as applied to biological problems will clear the ground and deserves careful study.

MECHANO-THERAPY.

A Text-book for Students. By MARY REES MULLINER, M.D., formerly Instructor in Mechano-Therapy in the Summer School of Harvard University, and in the Sargent School for Physical Education. Philadelphia: Lea and Febiger. Pp. 265. $2.75.

THIS is an interesting and well-constructed book. The general advice offered to the student of massage is excellent, and well worthy of close attention not

only by the practising masseuse but by the practitioner who employs her. A few curious slips are noticeable —such, for instance, as the statement that callus consists of cartilage, but they are few and far between. The nomenclature given to the movements of massage is confusing, but this is a point which need not be stressed, since no standard nomenclature is available. The short notes on "contra-indications for massage" are inadequate.

Throughout the book the right impression is left that the cure of the conditions treated by physical treatment does not depend entirely upon the operator, but much on the help of the patient. Particularly good are the chapters on the prescription of exercises and on relaxation; and, had the very high standard of the first seven chapters been maintained in the latter part of the work, this little book would deserve nothing but praise. At this point, however, there is a curious falling-off; indeed, the book leaves the same sort of impression as the paper of an examination candidate who, having devoted all his energies to answering the first few questions, becomes too tired to maintain a high standard. The early treatment of injuries is advocated, but not described, and far too much stress is laid on massage as distinct from treatment by movement. Few injuries are dealt with separately, and those who require help in this matter must seek it elsewhere. The accurate writing in the first pages gives place to such grotesque statements as that "massage may grind away these bony growths" (p. 174). The standard of the book improves again towards the end with occasional lapses, and little fault can be found with the chapters on digestion, the heart, and the central nervous system. It is curious that a subject like neuritis should be disposed of in half a page, and that peripheral neuritis should not be mentioned.

The book is concise and well written. The bibliography adds materially to the value. It might very easily be made the best of the short books on this subject of which the importance is becoming more generally recognised. If this end is to be attained considerable additions must be made, and some at least of the subject matter will have to be rewritten.

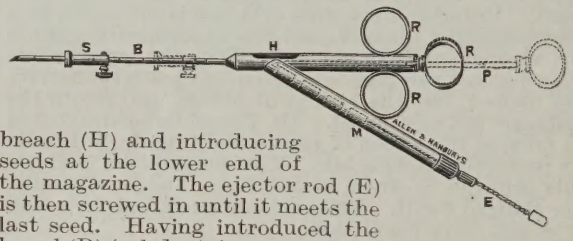
JOURNALS.

BRITISH JOURNAL OF CHILDREN'S DISEASES. Vol. XXVII., April–June.—Dr. N. Gray Hill contributes a paper entitled Notes on the Treatment of Juvenile Rheumatism based on the study of over 500 cases treated at Queen Mary's Hospital, Carshalton, since 1927. He discusses the various therapeutic methods, such as rest, heliotherapy, tonsillectomy, drugs, vaccines, and serums, and states that the basis of the treatment at Carshalton is rest under good hygienic conditions with a very gradual return to the normal activities of life. Although no specific treatment has been found up to the present, there are indications that calcium therapy may prove of value.—In a paper on Indications and Contra-indications for Removal of Tonsils in Children, Dr. P. D. Davidoff, of Taganrog (Russia), reviews the literature and records six personal cases in which tonsillotomy or tonsillectomy was performed with beneficial results for various conditions besides chronic tonsillitis.—Dr. D. Sage Sutherland contributes a paper on Gangrene Associated with Scarlet Fever, in which he emphasises the rarity of the condition, and records two personal cases. The first was that of a Jewish boy, aged 4½ years, who on the eighteenth day of a mild attack of scarlet fever developed gangrene of the left leg. A definite line of demarcation appeared just above the knee in the fourth week. A diagnosis of embolic gangrene was made and amputation was performed a fortnight later. No evidence, however, of thrombosis or embolism was found in the amputated limb. Recovery took place. The second case of gangrene occurred in a boy, aged 4 years, suffering from post-scarlatinal nephritis and otitis media, who developed purpura fulminans on the thirty-sixth day of disease and died on the forty-second.—Dr. Meta Mackenzie reports a case of Acute Hæmorrhagic Pancreatitis in a Congenital Idiot. The patient was a girl, aged 3 years, who developed acute abdominal symptoms after an attack of septic sore-throat and died suddenly. The autopsy showed a condition of acute hæmorrhagic pancreatitis with almost complete necrosis of the organ. All the other organs appeared normal, and nothing could be found in the brain to account for the sudden death.—Dr. A. V. Neale records a fatal case of acute anaphylactic shock. The patient was a girl, aged 6 years, who had never had any previous injections of serum or protein, but had been subject to attacks of shortness of breath since infancy. Thirty minutes after injection of hæmostatic serum to check hæmorrhage caused by tonsillectomy death occurred from respiratory and circulatory failure. A conspicuous feature post mortem was complete absence of coagulation of the blood. The thymus was normal.—The abstracts from current literature are devoted to acute infectious diseases.

New Inventions.

A NEW RADON SEED DEPOSITOR.

THE intention of the instrument here illustrated is to overcome the rather slow and tiresome operation of loading the gun each time with one seed; only one rod (P) is used and need not be taken out of the instrument at all, as is done in other models. (M) is the magazine lined with 2 mm. of lead which will hold about 15 0·5 cm. or eight 1 cm. radon seeds. The magazine is loaded by ramming home piston rod (P), which closes the opening of (M) into the open



breach (H) and introducing seeds at the lower end of the magazine. The ejector rod (E) is then screwed in until it meets the last seed. Having introduced the barrel (B) (ruled at 1 cm. intervals up to 10 cm.) into the tissues, the rod (P) is pulled back until it is clear of the breach (H)—a slight turn of the rod (E) which is a spiral, pushes up the column of seeds and *under direct vision* one seed is seen to appear and lie in the breach; rod (P) then pushes it on and out of the barrel (B). This process can be repeated in quick succession and the magazine emptied. The ring, finger and thumb grips (R R R) facilitate the use and steadying of the whole instrument. (S) is a sliding sleeve which may be fixed at any point along the ruled barrel (B). The rod (P) is bevelled slightly at its distal end and acts both as a needle and a pusher quite effectively. The instrument is heavy, simple, effective, and saves time. I would draw attention to two points; the breach is left open above deliberately to enable the operator to see one seed properly and safely introduced. It is absolutely necessary to allow one seed only to lie in the breach—the oncoming seed, if pushed too far by the fine adjustment rod (E) will foul the rod (P) when it is pushed home. The knack is easily acquired.

The makers are Messrs. Allen and Hanburys, Ltd. of Wigmore-street, London, W.

W. ETHERINGTON WILSON, F.R.C.S. Eng.
Torquay.

NATIONAL HOSPITAL, QUEEN-SQUARE.—From July 2nd the out-patient department of this hospital will be open from 1 P.M. on Wednesdays. Under this new arrangement out-patients will be seen each afternoon except Saturday.

THE LANCET.

LONDON: SATURDAY, JUNE 21, 1930.

REMOVAL OF THE PROSTATE.

IN his Lettsomian lectures on enlarged prostate and prostatectomy, publication of which was completed in our last issue, Sir JOHN THOMSON-WALKER has given us a shining example of the way in which progress is made in medicine and surgery. To every scientific advance innumerable workers contribute their quota, and whilst some may have given more than others to no single individual can be accredited all the merit of the final victory. Moreover, as the history of prostatectomy shows, progress is not necessarily continuous. Periods of stagnation and even of retrograde movement alternate with periods of progress. Unfortunately, in dealing with the enlarged prostate surgeons have not always recognised so clearly as has Sir JOHN THOMSON-WALKER this fundamental truth, and in the past an unwholesome rivalry has centred round the question who was the true discoverer of the modern operation of suprapubic prostatectomy. For this reason Sir JOHN THOMSON-WALKER'S excellent historical survey is to be welcomed, holding as it does a just balance between the rival claims of different pioneers and of different schools of urology.

Although the French surgeon AMUSSAT had removed an enlarged middle lobe with scissors by the suprapubic route in the year 1836, the story of prostatectomy really commences with McGill's operation in 1887. But from his own writings it is clear that McGill, however valuable we may deem his contribution to prostatic surgery, was content with the removal only of that portion of the prostate that projected within the bladder. Whilst this was a step forward in proving that enlargement was amenable to surgical intervention, the operation itself gave inconstant results. Dissatisfaction with McGill's operation of partial prostatectomy was soon voiced by BELFIELD of Chicago and KÜMMEL of Hamburg. Since normal micturition was not invariably restored by the removal only of the intravesical projection it was obviously necessary to deal with the remaining portion of the gland. As this was difficult by the suprapubic route, attention was directed to a new approach—namely, through the perineum. GOULEY of New York, HENRY MORRIS at the Middlesex Hospital, and ZUCKERKANDL of Vienna, all made attempts to remove the gland by the perineal method but with variable success. That the encouragement to push this line of attack was slight is indicated by the appearance at this moment of a new method of treatment which for a time stopped further progress. Working on the analogy existing between uterine fibromyoma and prostatic overgrowth, J. W. WHITE of Philadelphia suggested that a shrinkage of the enlarged gland might be obtained by the removal of the gonads. Castration therefore for a time was adopted as the easiest method of dealing with enlargement, but this mutilation gave results that were no more constant than those obtained from partial prostatectomy. Moreover, severe mental disturbance often followed castration in those patients who already displayed a degree of mental instability. Resort was had to vasectomy in an attempt to avoid this difficulty, but, although HARRISON and ROVESING recorded cases of cure from this procedure, it became increasingly clear that indirect methods offered little promise of victory over prostatic enlargement. The year 1900–01, as Sir JOHN THOMSON-WALKER aptly puts it, showed the renaissance of prostatic surgery. Those who had wandered from the path and sought a way round the difficulty retraced their steps. Partial prostatectomy both by the perineal and the suprapubic route found new advocates and again became the routine method of treatment of prostatic obstruction. At this moment FREYER made his appearance on the stage and by his publication of four cases treated by a "new and at first sight formidable operation" called the attention of the world to the possibility of completely removing the enlarged gland. Not that FREYER'S advocacy of total prostatectomy was received with universal favour after the publication of his successful cases; MAYO ROBSON, for example, had no hesitation in describing the complete extirpation of the prostate in its capsule as impracticable from an anatomical point of view. The confusion that then existed concerning the pathological anatomy of enlargement and the surgical anatomy of enucleation has continued in a minor degree until the present time. But FREYER'S success stimulated surgeons all over the world to attack the prostate directly and the death-blow was given to the idea of indirect surgery.

In his later lectures Sir JOHN THOMSON-WALKER discusses the refinements of the operation. Of these the most important are the methods of controlling hæmorrhage and the means of assessing the functional activity of the kidneys before operation. Whilst hæmorrhage was the more dramatic complication it was slowly realised that renal failure after the operation was a more frequent cause of death. Laboratory methods of estimating renal function were introduced to supplement clinical observations, and for those whose renal function tests worked out below a certain level a two-stage operation was instituted. Finally, the lecturer himself became a strong advocate of a new technique, the object of which was to bring prostatectomy into line with other operations and to substitute for blind enucleation an open operation carried out under full ocular control. As the recent discussion in the Urological Section of the Royal Society of Medicine has shown,[1] this operation is now in general use amongst British prostatectomists, although there are still some who consider that it is unnecessary and that the additional time entailed in carrying it out counterbalances any advantage it has to offer. At this point Sir JOHN THOMSON-WALKER'S interesting historical summary of prostatectomy ends, for it is here that we stand at the present moment. In spite of the knowledge we have gained, in spite of the improvements we have introduced into our operative technique, prostatectomy is still an operation that carries with it an unnecessarily big mortality. Speaking generally, it may be said that the nearer a technique approaches to the ideal the less are the variations introduced into its practice by different operators. That we are far from having reached uniformity in the carrying out of prostatectomy was amply demonstrated at the Royal Society of Medicine. We still have far to travel.

See THE LANCET, May 31st, p. 1184.

THE CAUSES OF FOOD POISONING.

WHILE the tendency during the last two decades has been more and more to regard the salmonella group of bacteria as the most important cause of food poisoning, it is clear that this organism cannot be held responsible for every poisoning outbreak outside the rare cases of botulism. W. G. SAVAGE and P. BRUCE WHITE have shown that certain dysentery strains produce food poisoning. Again, the *Bacillus proteus* group has often been brought forward, but here the supporting evidence has been slender, and a very clear case would have to be made out before any particular outbreak could be accepted as having such an origin. The same is true of the *B. coli* group, where the evidence has been even less cogent. On the other hand, there have been many outbreaks of gastro-intestinal disturbance in which bacteriological investigation has drawn a blank, and the responsible organism has been undetected. This has happened especially in mild outbreaks associated with consumption of cheese and milk, and in some of them the possibility of salmonella infection can be ruled out.

Recently in Chicago two sets of observations have suggested a new possibility. DACK and co-workers[1] have described an outbreak of food poisoning affecting 11 persons after eating three-layer sponge cakes filled with cream. Nine were acutely ill with vomiting, mild cramp, and severe diarrhœa, with an incubation period of one and a half to four hours; all recovered. The separate different components of the cake were without ill-effect when fed to monkeys and to human volunteers, but a volunteer who ate 50 g. of the sponge cake substance itself developed symptoms closely resembling those of the original sufferers. Bacteriological examination of the cake substance showed a yellow hæmolytic staphylococcus as the most prevalent organism. A human volunteer who drank 25 c.cm. of a sterile filtrate from a broth culture was ill exactly three hours later with extreme prostration, diarrhœa with blood and mucus in the stools, and apparently some vomiting. Two other volunteers who drank 10 and 5 c.cm. respectively had minor symptoms. Following up this experience Prof. E. O. JORDAN,[2] the head of the same laboratory, tested the effect of other staphylococci, and isolated five strains which yielded filtrates, toxic when taken by the mouth. Three were obtained from normal human throats, one from a case of human septicæmia, and the other from cheese suspected of causing an outbreak of food poisoning in a village in Porto Rico. These five strains, and also the cake strain, differed from one another culturally, so they do not represent a homologous type. The method of testing employed was to filter 48 hours'-old broth cultures through Berkefeld filters and, after testing for sterility, to feed to human volunteers in doses of 5 to 10 c.cm. given in pasteurised milk. About 80 feeding tests were made on 48 male volunteers, and in most of them symptoms of mild food poisoning developed several hours afterwards. These symptoms included dizziness, loss of appetite, weakness of the legs, headache, abdominal pain, nausea, vomiting, and diarrhœa. They were transient, and usually by next morning the patients were quite well. Boiling, and even heating for 30 minutes to 60° C. or 65° C., destroyed the potency of the toxins.

Prof. JORDAN concludes that various strains of staphylococci of diverse origin and different cultural characters are capable of generating in broth a substance which, when taken by the mouth, produces gastro-intestinal disturbance, and he suggests it is not unlikely that bacteria of other groups may produce similar substances that are irritating to the human alimentary canal. If these observations are confirmed and found applicable to this country it may be possible to explain more of our minor food poisoning outbreaks. Animal experiments are, however, almost useless for this type of investigation, and the Chicago investigators seem to have been particularly fortunate in having at hand an unlimited supply of "subjects" willing to offer themselves for experimental purposes.

[1] Dack, G. M., Cary, W. E., Woolpert, O., and Wiggers, H.: Jour. Prev. Med., 1930, iv., 167.
[2] Jour. Amer. Med. Assoc., 1930, xciv., 1648.

EXPERIMENTAL CARCINOGENESIS.

THE production of cancer in laboratory animals was a most important advance in modern medicine, and the possibilities of the method are now being exploited along different lines by a great many workers. One advantage of working with such a short-lived animal as the mouse is that cancer can be produced in a relatively short time under experimental conditions. A large amount of pathological material can be collected by a single group of workers for the investigation of any one of the numerous problems of cancer in the time it would require to collect a few isolated cases in man. The paper published in our columns by Dr. C. C. TWORT and Mr. J. M. TWORT is based on 4000 tumours of the skin produced by exposing over 29,000 mice to the action of various carcinogenic agents. Of these tumours 1743 were malignant, and the paper is an attempt to classify the different types of growth which have been observed. It is remarkable how great is the variety of forms in which the process of malignancy can express itself in one and the same tissue; under the influence of a carcinogenic agent the cells of the epidermis, or of the hair follicles, or of the sebaceous glands may become malignant. Morphologically the malignant cells themselves may show wide variations, even taking on the shape of spindle cells so as to resemble a sarcoma. Most of these appearances have been described before, but not on such an extensive scale. What is new, however, is the suggestion that the change to the spindle form is due to septic infection of the growth. The prickle cell, being unable to withstand sepsis, would be destroyed by infection, unless it underwent metaplasia into the spindle-cell type which is supposed to be more resistant. Change in morphology of the cells is attributed by the authors to the influence of neighbouring cells; they refer to this change as "a fundamental biological phenomenon." It is a very interesting suggestion, but before it can be accepted more conclusive evidence is required. The experimental methods of transplantation and of tissue culture might help to throw light on the point.

A very different line of investigation has been pursued by Dr. E. L. KENNAWAY and his associates. Since the normal carcinogenic agents, such as tar or shale oil, are crude mixtures containing a large number of different substances, Dr. KENNAWAY has been working on the assumption that these mixtures owe their carcinogenic action to the presence of a chemical substance which has the specific property of producing cancer. Although it is not clearly stated, he seems to consider it possible that when cancer arises spontaneously this may be due to such a substance being produced by the cells of an organ when they are submitted to chronic irritation—a working hypothesis applied with much experimental

skill and resource. In a series of extensive investigations[1] Dr. KENNAWAY and his co-workers have prepared and tested a large number of organic substances, some of them fairly pure, while others have been mixtures obtained by the action of heat or of aluminium chloride on relatively simple organic compounds. The object of using the reaction with aluminium chloride was to seek for carcinogenic compounds formed at lower temperatures. It was found, however, that while the undistilled material was inactive, distillation under reduced pressure produced a fraction, boiling at 260°–320° C., which was actively carcinogenic. It appears, therefore, that the carcinogenic substance was produced by the heat of distillation, and that the original object of producing carcinogenic substances at body temperature was not attained. Of the number of simple substances tested 1 : 2 : 7 : 8-dibenzanthracene was the only one which was clearly carcinogenic. Contrary to expectation the carcinogenic power of this simple substance was weak, the period of induction being very long. So far the results do not support the idea of a specific carcinogenic agent, and Dr. KENNAWAY'S further researches on this point will be awaited with great interest.

In the course of these observations Dr. I. HIEGER,[2] working with Dr. KENNAWAY, observed that many of the substances having a carcinogenic action possess the property of fluorescing intensely when exposed to ultra-violet light. In studying with a spectroscope the fluorescence of a number of substances which were also tested for their carcinogenic property, he found that many substances producing cancer had a characteristic spectrum. It may be possible, therefore, to use the spectrum of a substance as an indicator of its probable carcinogenic activity ; for final proof a test on mice would remain necessary. Since certain heavy petroleum oils have been shown to be carcinogenic the fear has been expressed that the refined petroleum oils, taken internally for medicinal purposes or applied externally to the skin or nasal mucous membranes, might produce cancer. A priori the suggestion is improbable, for these materials have been used extensively over a number of years without producing any ill-effect. Prof. F. CARTER WOOD, of New York, has submitted[3] the question to exhaustive test both by external application to mice and by internal application to rats and mice. As was to be expected, these refined products were found to be entirely non-carcinogenic.

[1] Biochem. Jour., 1930, xxiv., 497.
[2] Ibid., p. 505.
[3] Jour. Amer. Med. Assoc., May 24th, p. 1641.

PROPOSED EXTENSION OF ST. MARY'S HOSPITAL, LONDON.—The annual report gives details of the extensive enlargements which it is proposed to make at this hospital. The scheme of immediate development comprises a pay-bed unit of 30 beds obtained by the conversion of a floor of the existing nurses' home, the provision of increased maternity accommodation, made possible by the rehousing of the inoculation department, which will set free some 50 beds, and the erection of the first block of the new nurses' home which will house 224 nurses. The general scheme provides also for the rebuilding of the medical school and the erection of a new inoculation department and institute of pathology and research. For these purposes an appeal for £250,000 will be made. Last year in-patients numbered 4995, their average stay was 22 days, and the average annual cost per occupied bed (average 302) was £181 3s., £21 below the average of the London teaching hospitals. It is pointed out as a financial weakness that 22 per cent. of last year's income was derived from legacies and grants from residuary estates which are necessarily uncertain and fluctuating.

Annotations.

"Ne quid nimis."

THE PÆDIATRIC CONGRESS AT STOCKHOLM.

IT is to be hoped that this country will be strongly represented at the International Pædiatric Congress[1] to be held at Stockholm from August 18th to 21st. The attendance from abroad is likely to be large and influential, but it is felt in Sweden that the Congress cannot be a complete success without active British coöperation. On such occasions the main advantage usually comes from personal contact between people interested in the same specialty, but the official discussions will be noteworthy if we may judge from the names of the contributors. The first subject, introduced by A. F. Hess, of New York, will be the Biological Effect of Direct and Indirect Ultra-violet Irradiation, and the speakers will include P. F. Armand Delille (Paris), K. Huldschinsky (Berlin), P. Medowikoff (Leningrad), and I. Jundell (Stockholm), who is chairman of the Swedish organisation committee. The second big discussion will be on the physiological and pathological significance of the thymolymphatic system, and the principal speakers will be J. A. Mammar (Upsala), C. Cattaneo (Milan), E. Moro (Heidelberg), and G. Mouriquand (Lyon). On the fourth day R. D. Gillespie (London), together with F. Hamburger (Graz), N. Krasnogorski (Leningrad), and V. Pechère (Brussels), will bring before the Congress the significance of the psychology and pathopsychology of childhood in its relation to pædiatrics and medico-social work. Outside these meetings there will be many lectures and individual communications, and after the Congress excursions may be made both near and far. Further information about the programme and arrangements may be had from Dr. J. C. Spence, 3, Eslington-terrace, Newcastle-on-Tyne, who is the secretary of the British committee of the Congress. The other members of this committee are Dr. Robert Hutchison, Dr. H. Morley Fletcher, and Dr. Donald Paterson.

THE CLINICAL FORMS OF OBSESSION.

OUR French colleagues have always paid great attention to the minor mental disorders, and in their "Obsessions et la Psychasthénie" (1903) Raymond and Janet describe what appears to some English readers as an unknown world of symptomatology. Dr. C. Vurpas, a physician of the Salpêtrière, takes up the subject in the *Presse Médicale* of June 4th, and points out how the sufferers hide their troubles from their friends and carry on with the affairs of life even though the symptoms lead to serious disturbances of conduct. The bookkeeper who must continually verify his accounts and his cash cannot carry out his work satisfactorily, nor can the waiter who must ceaselessly count his money till he loses himself in his calculations. How many unhappy homes, Vurpas asks, are to be explained by the obsessions and phobias of one of the spouses? Overscrupulous self-questioning may progress to haunting doubts of every action, till the sufferer's only refuge is a breakdown, during which he is spared the need of adjustment to the demands of ordinary life. The clinical descriptions given by Vurpas create an uneasy feeling that in this country the facile acceptance of "neurasthenia" or "nervous breakdown" as a diagnosis may hinder full understanding of the conditions we are treating, and those who are accustomed to seek for such symptoms as Janet described are not surprised to discover them concealed under such diagnoses. The concealment can be understood when we remember that the essence of an obsession —when the word is used in its proper sense—is that

[1] See THE LANCET, March 22nd, p. 639.

the symptom is recognised by the patient as absurd and irrational and is therefore to be hidden from the world. The frequent association of the disorder with high intellectual ability and devotion to work suggests that some puzzling cases of suicide, in which the victim is described as having possessed those qualities, may have their explanation in an unsuspected obsessional state, or, as Vurpas would express it, in a constitutional psychasthenia. He believes that in the true psychasthenic there are minor indications which, apart from the obsessions, reveal the psychical constitution; when these indications are absent the case belongs to some other group, commonly the manic-depressive, and this observation may help in the recognition of certain cases which, beginning apparently as obsessional states, falsify the resultant prognosis and become certifiable as frank melancholia. Obsessions may also, he thinks, mark an early stage of dementia præcox or general paralysis, may appear as fugitive symptoms in senile or arterio-sclerotic psychoses, or evolve parallel with another psychosis. Thus the obsessional symptom occurs in a larval form compatible with ordinary social life, being then controlled or even dissimulated; it often leads to a temporary breakdown or permanent incapacity; it is sometimes a part of a psychosis belonging to a well-defined clinical group. Although Vurpas follows Janet in regarding psychasthenia as a constitutional disorder for which only palliation is possible, yet more hopeful views are held as to the accessibility of these patients to analysis. His discussion of clinical possibilities is, therefore, of interest to the general practitioner who might overlook an important group of troubles, to the psychotherapist who must carefully select his cases for treatment, and to the psychiatrist who has the opportunity of watching the evolution of the psychoses.

DISCIPLINE IN MUNICIPAL HOSPITALS.

IN the army, the navy, the police force and other public services it is well understood that a clearly defined channel must be provided for the making of complaints. It is certain that there will always be grumblers, but it is equally certain that some grumbles will be justified. The sense of unfairness and injustice is not so bitter if the supposed grievance can be reported, investigated and dealt with by a known superior officer under some open and well-recognised system. The same principle applies to service in the nursing staff of a hospital. Prevention being better than cure, disciplinary difficulties may often be averted if the persons concerned are clearly instructed in their rights and duties. The public assistance committee of the Birkenhead Corporation recently had occasion to consider this question in connexion with the administration of a poor-law infirmary which the corporation had taken over under the Local Government Act of last year. The incidents which led to the inquiry are of no public concern; the recommendations which resulted are of more than local interest. Those who have any share in the organisation of a municipal hospital may usefully examine their own disciplinary conditions; if they have made no provision for the ventilation of grievances they should study the admirable report drawn up by Dr. D. Morley Mathieson for the public assistance committee at Birkenhead as the result of the recent inquiry and published in the *Medical Officer* for June 7th (p. 257). Discipline, as he observes, must be maintained. Discipline does not mean oppression; it means efficiency, precision, balance, fairness, self-control and harmony; the alternative to discipline is disorder. The hospital committee must support the medical superintendent and matron; the matron must support the sisters, who are her lieutenants. A matron cannot discuss a sister with a probationer; a member of the committee cannot discuss a matron with a sister, or a sister with a probationer. The nursing staff cannot approach individual members of the committee to voice grievances or discuss their conditions of work. Members of the nursing staff must be instructed that they are never to discuss hospital matters outside the hospital. Gossip about the patients or the staff is unprofessional and a serious breach of hospital discipline.

Dr. Mathieson's recommendations for the improvement of hospital discipline may be briefly summarised. He suggests that a log-book be provided for each sister wherein all reprimands and complaints are to be recorded. Minor corrections and admonitions such as normally occur in a probationer's training are not to be reckoned as reprimands for this purpose. But if a sister has occasion to reprimand a probationer for neglect of duty, disobedience, insolence, breach of rules or gross breach of nursing practice or for any other reason of like gravity, the sister will enter the full facts in her log-book. A complaint by a probationer is similarly to be entered. In either case both sister and probationer will sign the entry. If the probationer declines to sign on the ground that the entry incorrectly records the matter, there is to be an immediate reference to the matron, who will investigate forthwith and, if necessary, consult the medical superintendent. In certain events there is to be an appeal to the sub-committee. Where the reprimand concerns a sister, or where a sister makes a complaint, similar records will be made by the matron The purpose of this machinery is to ensure the prompt and regular disposal of matters of complaint, and thus to prevent the nursing of grievances and the demoralising effects of cavilling and other forms of disloyalty. The machinery should be as simple as possible. Recourse to it will not be frequent if those in charge of subordinate staff avoid ill-temper, undue, severity and unfairness. "A good disciplinarian," says Dr. Mathieson, "has no need to employ despotic or spectacular methods, and is kindly, impartial and even-tempered when dealing with subordinates; this is especially so when any reproof or correction is called for."

SO-CALLED SCIATICA.

THAT man's assumption of the erect attitude has much to do with many cases of sciatica is becoming increasingly evident, and A. P. MacKinnon [1] says that he regards most cases of sciatic pain as due to some disturbance in the fundamentally unstable sacro-iliac or lumbo-sacral joints. Goldthwait, Smith-Petersen, and Danford and Wilson in America, and Sicard and Putti in Europe, have drawn attention to the part which strains, injuries, and disease of the lower part of the spine may play in producing pain along the course of the sciatic nerve. C. W. Buckley [2] in this country found that in 108 patients complaining of sciatic pain the main underlying conditions were osteo-arthritis of the hip (30 cases), lumbar and sacro-iliac strain (26), neuritis of the sciatic nerve (20), and sacralisation of the last lumbar vertebra (9)—or, to put it another way, only 20 of his cases had a neuritis of the sciatic nerve. MacKinnon looks on lumbo-sacral arthritis as the main cause, and thinks that other pathological conditions, especially sacro-iliac disease, are of minor importance. It is true that the anterior ramus of the fifth lumbar root, which plays such an important part in the formation of the sciatic nerve, is the largest of the emerging nerves, passes through the smallest intervertebral foramen, and has the longest bony canal to traverse before it reaches the cavity of the pelvis. On the other hand, our methods of differentiating lumbar arthritis and strains, sacro-iliac and lumbo-sacral disease are still so unsatisfactory that it is hard to accept his claim that the large group of cases previously classed as idiopathic sciatica should be regarded as symptomatic sciatica due to lumbo-sacral arthritis. If this were true the good results reported from local treatment of the nerve trunk itself would be difficult to explain. The nomenclature of sciatica will remain somewhat

[1] Canad. Med. Assoc. Jour., April, 1930, p. 492.
[2] Buckley: Practitioner, June, 1930, p. 653.

chaotic till more is known of the cause or causes. It is fairly certain that patients will stick to the familiar word, and practitioners will know exactly what they mean, especially if they too have suffered. There are few terms in medicine which are so definitive in the mouth of a patient, and at the same time so apt to mislead writers and readers of medical literature. There is much to be said for Sicard's classification of sciatic pain into high, middle, and low, according as to whether the mischief arises in spine, pelvis, or buttock and thigh. As Buckley points out, this is a useful differentiation for purposes of diagnosis.

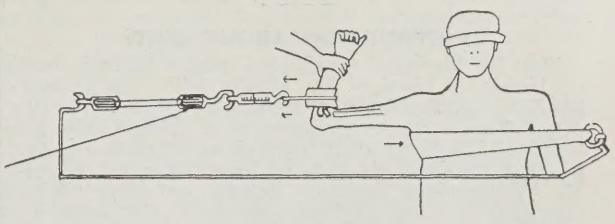
HOSPITAL LIBRARIES.

THE address given by Dr. C. Hagberg Wright at St. James's Palace during the recent British Empire Red Cross Conference was a timely reminder of an undertaking which has a great future as well as a very creditable past. The hospital library scheme, started by Mrs. Gaskell early in the war, was run on a vast scale by the British Red Cross and the Order of St. John. The war over, the marvellous stream of books to hospitals began to wane, but so urgent was the demand for books, and more books, by those who had known their stimulus and cheer that the Joint Red Cross Council gave a fund for the continuation of the scheme; and to-day the library is housed at Lancaster Gate, and carried on, in over 2000 hospitals, by a very small staff. Appeal is constantly being made to the public for books and magazines, which are distributed to hospitals that ask for them; when required and whenever possible, special technical books in addition are bought and supplied. But although the work has been unobtrusive, the realisation that libraries in hospitals should mean something more fundamental than a mere collection of books has begun to take root and to grow towards not only a national but an international ideal. America has an extensive and highly developed system of hospital libraries; Germany is giving close study to it, and efforts are being made in other countries. Public opinion is awakening to the necessity of a well-stocked library as part of the curative equipment of every hospital. But the well selected library is only the first stage of the work. It is of little value unless the books are distributed according to the tastes and the physical condition of individual patients. This means a system of librarians with knowledge of psychology as well as of literature. Sometimes a member of the hospital staff combines these duties, but more often a volunteer from outside has to be found. Methods vary in certain countries and their comparative merits await further study. In the stage that has been reached certain facts stand out clearly. First, hospital libraries depend for their success on wide study and above all on public opinion. The Hospital Officers' Association is taking a keen interest in the movement, and the February issue of the *Hospital* outlines a scheme for running a library in a large London hospital. In the Manchester Royal Infirmary a rota of Toc H members in conjunction with their league of women helpers distribute books to patients five nights in the week. Such libraries need the backing of the great body of doctors, nurses, hospital authorities, and welfare workers. It is easy enough to send a parcel of books to a hospital; it is less easy to fit the reading to the state of the patients, and to select books so that they may alleviate, amuse, or stimulate, as the need may be. In countless instances the mind of a patient can be relieved by the right book at the right moment; this is especially the case with interrupted studies. There are many incidentals of the work, such as unpacking, rebinding, cleaning, mending, listing, and packing, all important to the successful working of the scheme. Those who are doing this hospital library work would welcome inquiries and constructive criticism. Correspondence may be addressed to the secretary at 48, Queen's-gardens, Lancaster Gate, W. 2.

REDUCTION OF FRACTURES.

THE first essential in the treatment of a fracture is its reduction, and this will often test the skill of the most experienced. Some form of traction is necessary, and during the last few years many surgeons have been considering what is the best way of applying it. Lorenz Böhler, of Vienna, has drawn attention to the value of pin-traction as a means of reducing, and maintaining the reduction of, fractures of a long bone. In fractured femur, for instance, a steel pin is passed in and out of the limb, through two skin punctures, and transfixes either the shaft of the femur below the fracture or the tibia below the anterior tuberosity; to the ends of the pin a steel stirrup is attached, and from this last a traction cord passes to a pulley and weight. The use of Kirschner's wire is lending this method a remarkable simplicity and precision. Recently a valuable contribution to the technique of fracture reduction has been made to the *Journal of the American Medical Association* (May 17th, p. 1547) by Robert Soutter, of Boston. The method is to increase traction gradually, under an anæsthetic, to an amount that will in 15–30 minutes relax the muscles enough to make reduction fairly easy. The traction is facilitated by an apparatus consisting of a rod 80 inches long bent at right angles at one end. The figure which we reproduce from the *Journal* shows the method of reducing fractures of the humerus and elbow.

"At the end of this right angle is a hook and at the other end of the rod is a hook. The rod is made up of several pieces, so that it may be taken apart and put in a small case. Each section is about 20 inches long. It is made of tubular steel and not of iron piping, as the latter does not stand the strain. Each tube is fastened to the next by a steel rod which is inserted in the tube. The steel rod should not bend and should be very strong. There are two webbing straps 46 inches long and 3½ inches wide with a heavy steel ring in each end. The webbing should be strong and double, and the ring should be stitched solidly so that the stitching will not rip. There is a spring balance that will measure 100 pounds, and there are two double block pulleys



with heavy cord. These block pulleys are 3 inches long and 1½ inches broad, and there are rings for hooks at each end."

Unbleached calico is used for making a Delbet knot for traction at the wrist or ankle in fractures of the upper or lower limb respectively; or at the ankle, instead of this knot, loops may be employed of heavy webbing 1 inch broad and 5 feet long made of three thicknesses stitched firmly together. The ankle and foot are encased in thick felt and the webbing is applied over it in the form of a figure of eight.

On the average traction begins with 10 lb., increasing at three-minute intervals to 20 or 25 lb., at which it remains for 15 to 30 minutes. The maximal traction in some cases is 15 lb., while in others, especially fractures of the femur, it may be 50 lb. or more; the amount is measured by a spring balance. At the end of the indicated time there is muscle relaxation lasting five to seven minutes, and during this period the fragments are manipulated into position with or without the maintenance of traction. If reduction is unsuccessful then the maximal traction is applied again for five or ten minutes more and another attempt made. When reduction is effected full traction is applied until the controlling splint is fixed; after this the traction is diminished—for example, when Thomas and sheet metal splints

have been securely applied to the leg the traction need not be much more than 10 lb. In summarising his views on this mode of treating fractures Soutter says that the difficulty lies not so much in the reduction as in the ability to wait patiently for the proper length of time before manipulating the fracture. He holds that many fractures which cannot be reduced by the usual methods will respond to this technique.

TUBERCULOSIS IN AMERICAN CHILDREN.

A GROUP of four articles reprinted in book form [1] from the *American Review of Tuberculosis* for October, 1929, deserves attention. The first is by E. L. Opie, H. R. M. Landis, F. M. McPhedran, and H. W. Hetherington, who describe the widespread incidence of tuberculosis in childhood and discuss the difference between children who may profitably receive treatment to prevent further development of tuberculosis and those, who, though infected, require no treatment. In the second article the same authors describe a survey undertaken in the attempt to determine the prevalence of tuberculous infection in school-children. It gives a full account of tuberculin results and X ray findings in children of different races and ages. The incidence of the tuberculin reaction increases from birth till adult life. The third article, by H. W. Hetherington, describes the organisation of open-air schools for the treatment of tuberculous children, and the fourth article, by F. M. McPhedran, deals with the diagnosis and classification of pulmonary tuberculosis in childhood and adolescence, and concludes with 44 excellent plates showing X ray appearances reproduced by an adaptation of the aquatone process. The usual clinical examination is not sufficient to discover what children need protection against tuberculosis, and the authors show the importance of other methods, such as tuberculin and especially X rays, without which no examination is complete. The work is one of considerable importance and will be much appreciated by those interested in the diagnosis, treatment, and public health aspects of tuberculosis.

INSTRUCTION ABOUT DIET.

THE fundamental truth that man's body is built up largely of his food has always been easily apprehended, and the notion that its quality and quantity can influence his development and maintenance has been pondered over and taught about by philosophers, prophets, and law-givers as far back as history records. Mr. Walter de la Mare has pointed out that "It's a very strange thing, as strange as can be, that whatever Miss T. eats, turns into Miss T." But what interests her parents, guardians, or medical advisers is the effect it has on her in the process. This is not at all easy to ascertain. The adaptability of living matter to obvious changes in the food-supply, its failure of adjustment to quite obscure changes, and its individual variation in responding to changes of any given kind, make it very hard to discover a definite relation between the character of the food eaten and the health of any particular person. It is true that much has been done of late years to shed light on the complicated problems involved. Careful experiments on animals have taught us to appreciate the value of certain foods and food constituents and, in a few instances, controlled observations on large groups of human beings have yielded definite results leading to similar conclusions. It is easy to be impatient of this tedious method of arriving at the truth and, impressed perhaps by a few casual observations, one may feel called upon to expound principles of nutrition which not only have no scientific backing but may even have been proved contrary to demonstrable facts. If any useful purpose is to be served by wholesale propaganda in favour of food reform it is essential that any definite recommendations made should be supported by clear evidence that they are fundamentally desirable. A pamphlet on children's diet, recently published by the Food Education Society, illustrates the difficulties of broadcasting practical advice concerning the choice of food for children. Some of the advice contained in the leaflet is without question of real importance, as for example the warning against too exclusive a use of sugars and starches, the encouragement of a more liberal consumption of vegetables, salads, and fruit, and training in good habits of mastication. But in many respects the advice given must prove puzzling to those who are acquainted with the established principles of nutrition. The impression is given, for instance, though perhaps not intentionally, that milk is not merely unnecessary for young children but positively harmful. Meat is considered almost a poison, and meat soups, gravies, and extracts are even more dangerous, because they are said to contain the concentrated poisons of animals. It is suggested that children should rely on cheese, eggs, and nuts for their necessary protein though even eggs are to be used only in moderation. Bananas are stated to be responsible for a great deal of digestive disturbance and milk puddings should be barred from every table. That children may apparently thrive under such régimes no one need doubt, for it is known that men can be reared on diets of extraordinary diversity. The education of the public to realise that the nature of the food given to a child may determine the perfection of his physical development and his reactions in after life to disease-producing agencies is an estimable object. It cannot be too strongly emphasised, however, that for such propaganda to have any enduring success it must be based on facts which can be scientifically proved and must be as free as is humanly possible from any taint of prejudice.

PUBLIC HEALTH IN SHANGHAI.

THE report of Dr. C. Noel Davis, commissioner of public health of Shanghai for the year 1929, has just appeared, and is a document of real interest. Indeed the Shanghai Medical Society, upon its publication, has placed on record its high appreciation of the activities of the public health department of the Shanghai municipal council. But the honorary secretary of the Society, Dr. H. Cooper Patrick, in sending the findings of a subcommittee of the Society presented to the annual meeting some two months ago, indicates that it is only the position of State medicine that is satisfactory to the Society, for otherwise the medical profession suffers in Shanghai from heavy professional drawbacks. The report of the subcommittee of the Society emphasises the mischief done through the licence enjoyed for medical practice by persons who are not registered as qualified practitioners in their own country. At the present their practice and professional status seems unaffected by the absence of proof that they are doctors. The Society therefore suggests that a board of medical registration should be formed with the duty to issue licences to those properly qualified to practise in the Settlement, and that similar registration restrictions should also be required for pharmacists. It is almost a direct sequel to such resolutions that the Society should also insist on the standardisation of teaching schools, especially those attached to hospitals. These resolutions are in accord with recognised developments of medicine in civilised countries, and the suggested reforms would follow along the indicated lines. The Shanghai Medical Society enjoys a good professional position and membership is open to all properly qualified medical practitioners recognised as such in their own country. It has existed nine years, its presidential chair has been occupied by members of American, British, Chinese, and French nationalities, and its proceedings should assist the undertakings of the League of Nations in international

[1] Tuberculosis in Public School Children. By Various Authors. From the Henry Phipps Institute of the University of Pennsylvania under a grant from the Metropolitan Life Insurance Company. Pp. 223.

hygiene. Dr. Noel Davis's report calls particular attention to the epidemics during the year of cerebro-spinal fever, which was reported in Shanghai in March, and cholera which appeared in September in a severe form, though with a lower mortality than had characterised previous outbreaks. In this connexion he makes reference to the visit paid at the end of the year by Dr. Rajchman, Director of the Health Section of the League of Nations, finding it "impossible to estimate too highly the achievements of the League in the cause of international science." Dr. Rajchman was accompanied by Dr. Boudreau, and they took part in an interesting discussion with a number of Chinese and foreign officials, having for its object the prevention of cholera and other communicable diseases in Shanghai. The statistical summary, derived from an interesting report, justifies Dr. Davis's optimistic outlook.

UNDULANT FEVER IN MALTA.

THE paper by Sir Themistokles Zammit and Dr. J. E. Debono, which we publish on another page, comes as a rude reminder of the fact that although the labours of the Mediterranean Fever Commission of 1904–05 removed, for all practical purposes, the dreaded undulant fever from the medical history sheets of the Services, the civil population of Malta, left to work out its own salvation, still suffers as heavily as ever. From the most recent report on the health of the Maltese islands we learn that in 1928 undulant fever headed the list of notifiable infectious diseases, with a total of 962 cases and 42 deaths among the total population of 230,618. As the bulk of the cases involve young adults, the problem is a serious one for industry as well as for the public health authorities. It is now generally accepted that in at least 70 per cent. of the cases the disease is conveyed by milk derived from goats infected with *Bacillus melitensis*, and it is equally clearly established that the infectivity of the milk can be readily destroyed by boiling or even by efficient pasteurisation. It is difficult, therefore, to understand why the disease has not been stamped out from the Maltese islands during the interval (now a quarter of a century) that has elapsed since the findings of the commission were made known, and why no attempt has been made to cope with the situation either by the adoption of palliative measures such as compulsory sterilisation of the milk, or measures based upon the Bang process for the eradication of the infected animal—practical proposals which were made by Dr. John Eyre in a report upon the work of himself and his colleagues in 1906. The answer to these questions undoubtedly is that local conditions, only too familiar to those who have worked in Malta, coupled with lack of financial support, have stultified the efforts of the public health department in dealing with the infected milch goat. It is true that Zammit, who has never allowed his ardour in the study of *melitensis* infection to lessen, has from time to time aroused the sympathetic attention of various authorities, but in the past lack of funds has operated adversely toward his endeavours. His present investigation, however, appears to have received material support from the Legislature of the island, and the results he records, though by no means conclusive, suggest that he has achieved a measure of success. His attempts at cuti-immunisation form a logical corollary to Besredka's claims, and if these latter are based on solid foundations, it may well be that modifications in technique will enable Zammit to confer a lasting benefit upon his fellow-countrymen. Incidentally his observations bring out a disquieting but very important point—namely, that certain animals, though proved by post-mortem examination to be heavily infected, fail during life to show what has hitherto been regarded as the cardinal sign of infection—i.e., specific agglutinins in the blood serum. This observation is one that demands further and fuller investigation, because if it holds good to any marked extent it must greatly increase the difficulties of prevention.

STREET ACCIDENTS.

THE note on street accidents in Bremen (see p. 1362) by Major P. G. Edge, of the London School of Hygiene and Tropical Medicine, raises an interesting question. Major Edge points out that the allocation of responsibility for traffic accidents made by the Bremen authorities contrasts glaringly with that established here with respect to *fatal* accidents, and suggests that a concentration of attention upon the latter may give us an incorrect view of the ætiology of a disease which claims thousands of victims. Some of the most fruitful work of the Industrial Health Research Board has been based on the study of trivial accidents, has established the importance of individual psychological factors, and has gone some way towards the differentiation of the temperamental types prone to accident. It is probable that these results may be generalised and that there are now in legal control of masses of steel capable of being hurled through our streets at high velocity many persons not only unfit to shoulder such a responsibility, but not capable of discipline by legal sanctions. Evidently the first step towards real knowledge is a more precise analysis of a sample of the facts than has yet been published. Major Edge makes some valuable suggestions. In addition to these we think some use might be made of car insurance data. The companies presumably now possess extensive particulars of accidents of all degrees of gravity. Is it too much to hope that this experience will be used? An analysis of such data by a scientific committee containing medical, psychological, statistical, and engineering experts should be illuminating. It may be true that a mere test of proficiency, even if administratively practicable, would be but a poor safeguard; yet the contrast between the stringent conditions imposed upon would-be amateur aeronauts and the free trade in terrestrial locomotion is curious. That the only guarantee of fitness our laws demand of a raw lad, before he is allowed to bring out upon a crowded highway a ton and a half of machinery, capable of passing from rest to a velocity of 60 miles per hour within a few seconds, is his ability to write his name and pay a sum of 5*s*., may seem to a future generation at least as monstrous as any of the savage customs of our ancestors.

VARIABLE RESPONSE TO INSULIN.

IT is a common observation that some diabetic patients vary from time to time in their reaction to similar doses of insulin, even in the absence of complications, such as infections, which tend to aggravate the disease. Karelitz and co-workers [1] have recently investigated the suggestion that this variability in response to insulin is due to the presence in the diabetic patient's blood of some substance which neutralises or inactivates insulin. They find that insulin, after incubation with blood plasma obtained from a diabetic patient, loses its power to produce hypoglycæmia in rabbits. Intact corpuscles give indefinite results, but laked corpuscles possess the same property of inactivating insulin to an even greater extent than plasma. Control experiments in which saline solution, agar-agar, and egg albumin are substituted for blood yield negative results, and such changes as occur in the pH of the incubated mixture are insufficient to explain the phenomenon. It is, however, a significant fact that normal blood possesses this same inhibiting action on insulin, although in much smaller degree. It is difficult to assess the importance of these results, since eight years of research following the isolation of insulin have failed to reveal either the structure of the hormone or the way in which it exerts its profound action on carbohydrate metabolism. Further control experiments seem desirable, for such a mixture of substances foreign to the rabbit as human blood

[1] Karelitz, S., Cohen, P., and Leader, S. D.: Arch. Int. Med., April, 1930, p. 546.

might well provoke reactions which would quite indirectly interfere with the action of insulin. Such a possibility could be excluded by observing the effect on the rabbit's blood-sugar of blood and insulin. incubated separately and injected simultaneously. A. A. Epstein and N. Rosenthal believe that in diabetes changes in the permeability of the vessels permit trypsin to leak into the blood stream, where it antagonises insulin. But it is difficult to believe that we are dealing with trypsin, for normal as well as diabetic blood possesses this property.

These experiments, at present, do no more than confirm the impression that the action of insulin involves a very complex type of chemical reaction.

INTERNATIONAL STANDARDISATION OF COLOUR VISION TESTS.

FOLLOWING on resolutions passed by the Scandinavian Ophthalmological Congress, the subject of international standardisation of colour vision tests has been considered by the International Labour Office at Geneva. A report on the subject, prepared by Prof. Oscar Oblath, of Trieste, has now been translated into English.[1] Of the tests in general use, Holmgren's wool test is found to be an inadequate test of fitness for the railway service, on the grounds that the large size of the test objects allow those with a central scotoma to pass, and that the saturation of the colours makes the test too easy for the detection of the slight defects. The most efficient test for examining on a large scale is declared to be Stilling's pseudo-isochromatic diagrams as revised by Hertel and published by George Thieme, of Leipzig (1926). In this test, on a background composed of colour spots of different sizes, numerals are marked out in spots of the confusion colours. Railway candidates, it is said, should be able to pass two of the most rigorous tests. The anomalascope of Nagel is a test in which the candidate has to mix a measured amount of red and green lights until they match a constant yellow, and for scientific purposes a quantitative test of this sort is desirable. Edridge-Green's lantern—the test employed by the Board of Trade in this country—is acknowledged to be efficient in the hands of a competent examiner, but the fact that in this test the colours have to be named by the candidate is regarded as a disadvantage; it must be noted that Dr. Edridge-Green himself claims this as an advantage, since in actual life the engine-driver (for instance) has to name the colours to himself in order to distinguish them—a point of view endorsed by Sir John Parsons.[2] In view of the fact that a considerable number of railway accidents and disasters at sea have been proved to have been due to defects of colour vision, the importance of the subject is evident. The report recommends that every Government should establish regulations specifying which employees in the transport services, whether by land, sea, or air, ought to be subject to an examination of their colour vision, and stating precisely the methods to be used in the examination and the manner in which they ought to be applied. Uniform regulations for all countries is the ideal, but, short of that, each country should have a definite legal enactment applicable to all the services concerned.

[1] Geneva, 1929. London: P. S. King and Co. 2s.
[2] Diseases of the Eye, fourth edition, p. 381.

TREATMENT OF EARLY NERVOUS DISORDERS.—The Sussex County Hospital at Brighton is preparing to open in the autumn a department for the treatment of early nervous disorders, and Dr. Helen Boyle and Dr. George H. Harper-Smith have been appointed honorary medical officers. It will be a consultative out-patient department and will be worked in coöperation with the Lady Chichester Hospital, Hove.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. K. D. Bell is placed on retd. list with the rank of Surg. Capt.

Surg. Lt.-Comdr. (D) F. W. Watt is appointed to the *Victory*, for R.N. Barracks, Portsmouth.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. (temp. Col.) D. S. Skelton, from R.A.M.C., to be Col.

Lt.-Col. E. Bennett retires on retd. pay.

Lt. A. R. Cowan relinquishes his temp. commn.

ARMY DENTAL CORPS.

Capt. H. F. Byrne to be Maj.

ARMY RESERVE OF OFFICERS.

Maj. A. W. A. Irwin, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

MILITIA.

Maj. J. R. R. Trist retires on attaining the age limit and is granted the rank of Lt.-Col.

TERRITORIAL ARMY.

A. S. Henderson to be Lt.

ROYAL AIR FORCE.

H. R. Clein is granted a short service commission as a Flying Officer for three years on the active list.

Flight Lt. R. Boog-Watson is promoted to the rank of Squadron Leader.

Maj.-Gen. W. R. Blackwell, late R.A.M.C., has been appointed Hon. Surg. to the King, vice Maj.-Gen. H. P. W. Barrow, late R.A.M.C. (ret.).

ROCKEFELLER MEDICAL FELLOWSHIPS. — These Fellowships are awarded to graduates who have had some training in research work either in the primary sciences of medicine or in clinical medicine and surgery, and who are likely to profit by a period of work at a chosen centre in America or, in special cases, in Europe, before taking up positions for higher teaching or research in the British Isles. The Medical Research Council announce that on behalf of the Rockefeller Foundation they have appointed the following graduates to Travelling Fellowships for the academic year 1930–31: Russell Claude Brock, F.R.C.S., of Guy's Hospital; Frank Burnet Byrom, M.R.C.P., of the London Hospital; Desmond Curran, M.R.C.P., of the Hospital for Epilepsy and Paralysis; Alan Aird Moncrieff, M.R.C.P., of the Hospital for Sick Children, Great Ormond-street; Arthur Spencer Paterson, M.B., Assistant Physician to the Royal Glasgow Mental Hospital; and Charles Cady Ungley, M.R.C.P., of the Royal Victoria Infirmary, Newcastle-on-Tyne.

Dr. Moncrieff's Fellowship is tenable at Hamburg; the others at centres in the United States. Mr. Brock and Dr. Curran have been appointed on modified conditions while receiving emoluments from other sources.

HOSPITAL ACCOMMODATION IN DORSET.—The Duke of Somerset last week opened an extension of Shaftesbury Hospital which provides four additional wards, two public and two private, containing 12 beds. The extension, which has been necessitated by the growth of the Hospital League, which has brought more patients, and the increase in motoring accidents, has cost nearly £5000.—At a conference between the Dorset public assistance committee and representatives of the voluntary hospitals of the county, it was stated that there are ten voluntary hospitals in the area. They contain a total of 394 beds, 67 of them for children, and 22 for maternity cases. In 1929 they treated 5350 in-patients, an increase of 1146 since 1927, of which 221 were maternity cases. The Cornelia and East Dorset Hospital, at Poole, with 105 beds, is the largest in the county, and last year it treated 1369 in-patients and 105 mothers. It was suggested that the 393 sick and infirm now under the care of the public assistance committee in 11 different institutions might be concentrated in from four to six infirmaries, but no recommendations were made.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles Contributed by Invitation.

LXXVII.

INTERPRETATION OF BLOOD FILMS.

MEDICAL diagnosis is a kind of speculation that should, so far as possible, be founded on facts. The interpretation of a blood film as an aid to diagnosis is in this respect twofold. The facts are dependent upon an accurate recognition of any morbid changes which may be present; the speculation is the application of these facts to the clinical condition of the patient. It must be insisted at the outset that an accurate description of a blood film requires a long and very special training, and that the information afforded by a film alone is rarely sufficient for a diagnosis, and never equivalent to that provided by a complete blood examination. It is often possible, however, from the preliminary examination of a blood film to decide if a complete blood count is necessary or not, and, provided that the pathologist is given some clinical account of the patient, data bearing upon the diagnosis are frequently available.

PART I.*—THE RED CELLS.

In the stained film preparation alone we have only to consider the three formed elements of the blood, the red cells, platelets, and white cells. The red cells may vary in number, size, shape, staining reaction, and maturity. The film gives little or no indication of the number of red cells present to the cubic millimetre. Deviation from the normal size can be estimated from a dried film, since the shrinkage of the red cells in the process of drying and fixation does not vary widely in different preparations.

Variation in Size.

Marked variation in the size of the red cells present is usually associated with alteration of shape (poikilocytosis), and may be found in any form of anæmia. Such cells may be pear-shaped or otherwise distorted, and these appearances can be distinguished from simple crenation or the effects of undue pressure in making the film. These changes are only very exceptionally present with a high red cell count, and are most extreme in pernicious anæmia, where they may occur before any serious diminution in the number of red cells has taken place. In the rare condition of aplastic anæmia alterations in size or irregularity in size (anisocytosis) occur without alteration in shape, the majority of the abnormal cells being small. In pernicious anæmia the average diameter of the red cells is above the normal, and this increase of size is a valuable diagnostic feature, since in the majority of secondary anæmias the average size of the red cells tends to be below normal. The megalocytosis is usually sufficient to be recognised without direct measurement by the experienced observer, but in case of doubt actual measurement is advisable.

Depth of Staining.

The depth of staining of the red cells gives a fair indication of the amount of hæmoglobin they contain; pallid cells with a large and colourless central area are suggestive of a considerable degree of anæmia. The percentage of hæmoglobin cannot be even approximately estimated, but it is usually possible to tell from the film alone whether there is a grave hæmoglobin loss or not.

Polychromasia.

A purple tinting of the red corpuscles with Leishman's stain, or *polychromasia*, is never general, and the proportion of cells so affected is an indication of the number of immature cells. Wrinkled, polychromatophilic cells are frequently reticulocytes, and are numerous in certain phases of pernicious anæmia, but are seen in other states and are most abundant in the relapses of hæmolytic icterus. The absolute recognition of reticulocytes requires a special staining process for the reticulum which is not effective in a dried film. Polychromasia is always present in films showing any marked degree of poikilocytosis and in all nucleated red cells. Generally speaking, it may be said that changes of shape, size, and staining reactions vary together and indicate the same process—namely, the reaction of the red marrow to red cell destruction. Complete absence of these changes negatives any severe form of anæmia (with the single exception of aplastic anæmia), their presence varies with the severity of the anæmia, being most extreme in untreated pernicious anæmia and least evident in the milder secondary anæmias.

Granular Degeneration.

Stippling of the red cells, or granular degeneration, is a condition in which the red cells are found to have a powdering of fine bluish granules through their cytoplasm. This change may occur in primary and, to a less degree, in any form of secondary anæmia; it is rare, however, to find granular degeneration in any considerable proportion of the cells or in a coarse and obvious form in any other condition than acute lead poisoning. Red cells showing this change may be present in lead workers without actual symptoms of poisoning, but they may be absent in chronic cases, even when colic or palsy have occurred, and as evidence of lead absorption are not so dependable as the presence of a blue line on the gums or lead in the urine. In acute lead poisoning stippled cells are in the degree in which they are usually found, almost diagnostic of the condition and may afford the first clue to the diagnosis.

Normoblasts and Megaloblasts.

Nucleated red cells are entirely absent from the peripheral circulation in normal adult life. In childhood nucleated red cells are present at birth, and may reappear in the circulation in response to mild stimuli. The interpretation of the blood film in children under 8 years of age must always be undertaken with the understanding that the cellular elements are far more subject to fluctuation than in later life, and that primitive cells may appear in considerable numbers in almost any trivial disorder. In the adult even the finding of a single normoblast is of significance, and the presence of megaloblasts may be of serious import. The distinction between normoblasts and megaloblasts is necessary owing to the different conditions associated with the appearance of these two cells in the peripheral circulation. The histological differences are mainly in the nuclei, less in the relative sizes of the cells. The normoblast is a dead cell with a deeply and evenly staining or "pyknotic" nucleus, the megaloblast—in its more primitive form—is a living cell with a peculiar stippled network in the nucleus. The normoblast may appear in any secondary anæmia, such as that consequent to hæmorrhage, provided the blood loss is severe. The megaloblast is only found in a limited number of serious disorders. It is a diagnostic feature of pernicious anæmia, but occurs also in the severe anæmia of the puerperium, in myelophthisic anæmia, in the leukæmias, and in the small group of disorders associated with a pernicious anæmia blood state, including the anæmia of sprue and poisoning by arseniuretted hydrogen. In these anæmias, as in pernicious anæmia, a tentative diagnosis may be hazarded from the blood film alone, the chief points being advanced alterations of shape and staining reaction of the red cells, an increase in the average size, the presence of megaloblasts even in very small numbers, and, in addition, an apparent leucopenia with a relative lymphocytosis. In the anæmia of cancer, associated with secondary deposits in the

* Part II., on the White Cells, will appear next week.

red marrow—myelophthisic anæmia—there may be no noteworthy blood changes, but more frequently the changes are extreme, and the film alone may be almost diagnostic. The chief features are the presence of nucleated red cells, both normoblasts and megaloblasts, in numbers approaching that of the white cells, extreme changes in shape, size, and staining reactions, and the appearance of occasional primitive white cells. The general appearance of the film may be indicated by the confession that it is the preparation one usually demonstrates to students, as from a case of pernicious anæmia, a disorder in which these changes are all present but never to this degree. The average size of the red cells is, however, small, and the blood count reveals a low colour-index.

Parasites.

The examination of a blood film for the parasites of tropical diseases is scarcely within the scope of this article, but the identification of the malarial plasmodium may be mentioned, since it not infrequently happens that they are met with unexpectedly in an obscure case of fever. The parasites are recognised within the red cells in a Leishman-stained film by their blue staining cytoplasm, purple chromatin, and dark pigment granules. In the more usual forms in which they appear in blood films taken in this country the benign tertian parasite occupies an enlarged red cell without filling it; the quartan form usually occupies the entire area of a red cell of normal size, the malignant tertian parasites are usually very scanty, and appear as signet rings and crescents.

Blood-platelets.

The blood-platelets are readily recognisable objects in the stained film, and the only diagnostic information which they yield results from an enumeration of them. An accurate platelet count is completely upset after the blood is shed and clumping of the platelets has taken place, but the film is a fair guide to any gross change of number. The most extreme diminution of the platelets is found in the purpura of essential thrombopenia, and there is an evident loss in aplastic anæmia. The finding of abundant platelets in films from suspected examples of either of these two conditions would negative the diagnosis. The platelets appear in the films in increased numbers and in large clumps in a variety of clinical states, including the chronic leukæmias and the acute inflammations. These increases, however, are accompanied by other and more readily diagnostic changes in the leucocytes.

Summary.

Briefly, the chief points to examine for in the red cells of a stained film are those alterations of shape, size, staining reaction, and nucleation which indicate red cell loss and its normal sequel—red cell regeneration. Anæmia, in its milder forms, can only be recognised by a red cell and hæmoglobin estimation. The red cell changes of the more severe anæmias can nearly always be detected in the stained film, and some indications can usually be made out of the nature of the anæmia. The film, at any rate, will frequently direct us to the necessity of a fuller blood examination.

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MILLER GENERAL HOSPITAL.—The annual report of this hospital for South-east London records a financial crisis and describes how it was temporarily surmounted. Towards the end of last year the position became so critical that it was feared that a large part of the hospital would have to be closed. An appeal through the press was fruitless, but the crisis was averted by the grant by King Edward's Fund of £12,000 from the Thankoffering Fund. The year's expenditure exceeded £38,000 (151 beds were in use), as against £33,000 in 1928, when the average number of beds available was 136, and there was a deficit of £3781. The in-patients numbered 2200, an increase of 166; their average stay was 22·93 days. The new out-patients received in the various departments numbered 31,124, also a substantial increase.

Special Articles.

STREET ACCIDENTS.

BY P. GRANVILLE EDGE, O.B.E., F.S.S.,
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FOR some years the number of deaths caused by mechanically propelled vehicles has been increasing at about the same rate as the number of licensed vehicles. Between 1922–23 and 1928–29 the number of licensed vehicles increased from rather fewer than 1,000,000 to slightly more than 2,000,000. In 1923 2414 persons were killed in England and Wales; in 1928 the number was 5196. The price to be paid for the convenience and pleasure of motor transit is, it will be seen, a trifle heavy, and the industry and ingenuity of official statisticians are taxed to set out the information in the most illuminating way. Our own authorities are very energetic, but a recent report of the municipal authorities in Bremen[1] suggests some lines of inquiry which might be profitably followed here. The Bremen statisticians have gone to work with teutonic thoroughness; their records enable street accidents to be classified by hour, day, and month of occurrence and kind of vehicle or vehicles involved; they show whether the accident was due to mechanical defects in the vehicle, or to negligence, errors of judgment, or other faults on the part of the driver or pedestrian; whether the accident involved collision with roadside obstructions; degree of severity of injury received—slight, severe, or fatal, &c. (So complete are the particulars that it is curious to find neither the age nor the sex of persons killed or injured tabulated.)

The Bremen Data.

When attempting any examination of these records it is to be remembered that the Bremen data have reference to street accidents of all kinds, whether resulting in personal injury or deaths, or merely damage to vehicle or property. Such wealth of published information is not usual in our own country, where the tendency prevails of only publishing statistics of the numbers of persons killed or injured as the result of such accidents. It is a pity that some of the tabulations are not readily intelligible, still the general results are interesting.

It appears that street accidents in Bremen during 1929 showed an increase of 27 per cent. over the figures for 1928, largely due, no doubt, to the increased volume both of vehicular and pedestrian traffic during the period, since motor vehicles of all kinds had increased by over 30 per cent. in 1929, motor-cycles by 51 per cent., pedal cyclists by 34 per cent., pedestrians by 29 per cent., while other traffic showed percentage increases varying from 9–16 per cent.

The distribution of these accidents by month of occurrence reveals that during 1928 fewer accidents occurred during January than in any other month. In February, however, the figures were almost doubled, and thereafter followed a steady and continuous rise each month, with a further considerable increase during the month of July, when the peak of the accident curve was reached. In 1929, February was the month of fewest accidents, followed by a slight rise during March, and then a rapidly rising tide to the end of May; during June and July accidents were fewer—a rise in August—the peak being reached during the month of September. These differences may be attributed in part to the fact that while the summer and autumn of 1928 were

[1] Die Strassenunfälle in der Stadt Bremen. 1928 und 1929. (Bremen Verwaltungs-und Wirtschafts-berichte. Heft 1. January, 1930.)

generally wet, cold, and discouraging to the majority of pleasure-seekers, those seasons during 1929 enjoyed high temperatures and fine weather—conditions favourable to increased use of road traffic by tourists and others. When the data are further analysed to discover the accident incidence by days of the week, Saturday produced by far the greatest number of street accidents, with small peaks on Tuesdays and Thursdays, Sunday appearing a comparatively innocent contributor. No exact comparison can be established with the figures for London, but if the numbers of ambulance calls (street accidents) each day are tabulated, it may be seen that in London (as in Bremen) Saturday is unquestionably the most dangerous day of the week, Sunday the safest; curiously enough, the smaller peaks in London are Fridays and Mondays (week-enders?) and Wednesdays, the latter probably having some close correlation with early closing in provincial areas.

Daily Incidence of Accident.

The characteristic features of the incidence of street accidents tabulated daily by hour of occurrence in London and Bremen seem to be as follows:—

(*a*) In Bremen there is a steady rise between 11 P.M. and 2 A.M., though in London there is a decrease in the numbers of such accidents between 11 P.M. and 5 A.M.

(*b*) At 6 A.M., in both cities, the tide of increase definitely asserts itself, and continues to mount—in Bremen until 2 P.M., in London there is a noticeable falling-off between 9 A.M. and 11 A.M., then continuing to rise to 2 P.M.

(*c*) Between 2 and 3 P.M. a falling-off in both cities.

(*d*) Between 3 and 5 P.M. a rise in both cities, though less marked in London.

(*e*) 5 to 6 P.M. decrease in Bremen, followed by rise 6 to 7 P.M. 5 to 7 P.M. sharp rise in London.

(*f*) Between 7 and 11 P.M. in Bremen and 7 and 10 P.M. in London numbers rapidly decrease; but in London between 10 and 11 P.M. accidents again show a tendency to increase.

(*g*) Between 11 and 12 P.M. Bremen street accidents again show an upward trend, though in London during the same hours a falling-off is noticeable.

Not the least informative and useful tables are those wherein street accidents are tabulated (*a*) by district or ward of occurrence, and (*b*) according to cause. In the first of these it may be seen that Districts 1, 3, and 9 are the sites within whose boundaries the majority of these events occur—indeed, No. 1 District produces approximately 28 per cent. of the annual total of the city of Bremen; it is not without interest to note that Districts 1 and 3 are situated in the old town (*Altstadt*) with its narrow winding streets, while No. 9 District occupies the extensive dock and commercial areas of the city—all three districts on the right bank of the Weser; suburban extensions surround these areas, and include Districts 10–25, which show the lowest street accident rates recorded in Bremen. In regard to (*b*) above, "causes" are tabulated according to whether the accident was deemed to have been due to mechanical defects in the vehicle (brakes, steering, illumination, &c.), faults or negligence on the part of the driver (fast driving, driving on wrong side, cutting-in, &c.), faults of pedestrians (carelessness, &c.), and unavoidable accidents.

In this table (*b*) appear striking features worthy of comment. The Bremen data assert that over 50 per cent. of all street accidents are due to *faults on the part of the driver of the vehicle*, and between 9–11 per cent. to faults of pedestrians. Compare these rates with those of London; for the past few years, and certainly for the years 1928–29, pedestrians have been held responsible for approximately 50 per cent. of all *fatal* street accidents; official figures for the first three months of the present year assert that of 320 fatal accidents in the streets of London no less than 155 (or nearly 50 per cent.) were due to the carelessness of pedestrians.

Dead Men Tell No Tales.

Since there is no obvious reason to suppose that German drivers are less efficient than English motorists—some of whom, at least, are not *very* cautious—one is led to wonder whether the contrast may not be sufficiently explained by the adage that dead men tell no tales. After all, the most savage of motorists is not deliberately seeking the blood of his fellow creatures; his word is likely to be favourably received, and the victim is silent. The Bremen publication suggests a valuable statistical experiment. It is obvious that such elaborate details of the accidents in the whole metropolis could not be published; but there seems no reason why a sampling experiment should not be done, why typical streets of different types should not be chosen, and a complete enumeration on the German lines be published. There was a time when the motorist was the scapegoat of the community. He was preached at and fined with monotonous regularity. Times have changed; now it is the (surviving) pedestrian who is monotonously warned that "many of the fatal accidents could have been avoided by the exercise of a little care"—a truth of undoubted weight, of course, but neither new nor helpful. Just as in more technical medical statistics we need records of cases of disease as well as of deaths, here we need more information about non-fatal accidents in order to understand the ætiology of the disease of speed.

THE SHEFFIELD HOSPITALS CENTRE.

A STUDY OF COÖPERATIVE MOVEMENT.

SCHOOLS of medicine in this country as a rule began either as the private enterprise of some individual medical man or as a joint foundation by the members of the staff of some hospital. Most of the latter still remain, and the connexion between the hospital and its medical school in many cases still remains as intimate as it was originally. This is especially so in London where the various medical schools, although part of the university, are primarily the adjunct of the hospital concerned and bear its name. In the provinces, on the other hand, wherever a medical school has survived, a local university has eventually been founded, and in each case the fusion between the old medical school and the young university has been of a more complete kind. In some places where the hospital originally connected with the medical school has for long predominated in size or remained the only large hospital in the locality, it has become the sole clinical hospital connected with the university. In others where more than one local hospital has earlier or later been recognised as a teaching institution, the university has become associated with more than one clinical institution for its medical students.

In many ways the single clinical institution is the more convenient. Arrangements for the supervision of the students are more simple; organisation of their work is more easy. On the other hand, there is something to be said in favour of multiple clinical institutions. They widen the student's outlook and take away the tendency to insularity which, though attractive in youth, may not be altogether the best for his later career. In Sheffield when the university took over the medical school, two general clinical hospitals were connected with it, and both have continued as places of instruction for its students. In speaking of single or multiple hospitals, it will be realised that with the gradual separation of various groups of cases (maternity, mental, fevers, tuberculosis, and even venereal diseases), there is a certain amount of multiplicity in clinical hospitals connected with every school.

At the present time there are four voluntary hospitals in Sheffield, two general and two special, and they are all attached to the university for teaching purposes, although there is no actual written agreement between the university and any one of them. By the terms of the University Charter, the Royal Infirmary and the Royal Hospital have a member of their staff on the council of the university, but the latter

has no official representation on the board of any of the hospitals. On the academic side the relations between the university and the hospitals are, and always have been, exceedingly close. Thus in addition to the purely clinical teachers, the professors of pathology, pharmacology, and physiology in the university are all members of the hospital staffs. In the case of pharmacology the professor is a full physician to the Royal Infirmary with his own beds and assistants, whilst the professors of pathology and physiology are respectively in immediate control of the clinical laboratories dealing with their particular subject at the various institutions. A short account of the origin of the voluntary hospitals and development will show how the present position has come about.

The Royal Infirmary.

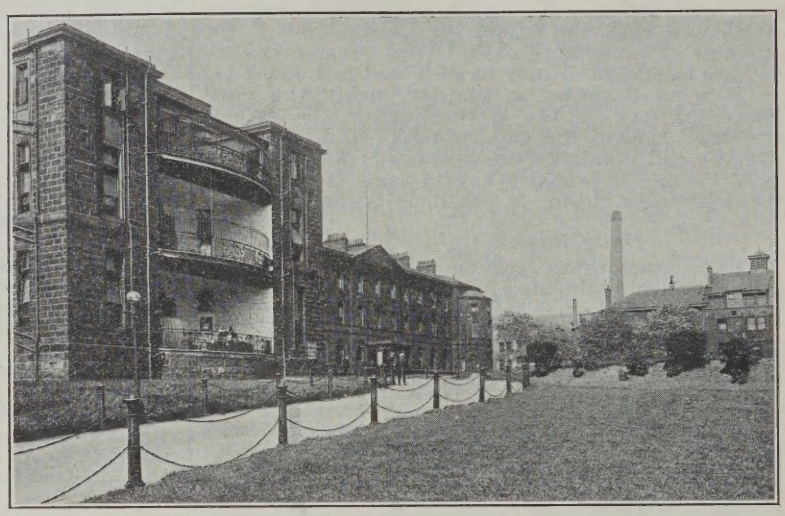
The first public suggestion that an infirmary should be established in Sheffield came from a medical man (Dr. William Younge) in a letter dated April 19th, 1792. As a result of this a public meeting was held in the town hall on April 23rd, the foundation-stone was laid on August 29th, and the General Infirmary was opened with much pomp and ceremony on Wednesday, Oct. 4th, 1797 (Fig. 1).

The first addition to the original building was made in 1847, the jubilee year of the infirmary. The financial position caused much anxiety, the invested funds had fallen from £20,000 to £12,000, and the weekly board spoke of the institution as "this deserving but decaying charity." In 1849 the board advertised for a nurse "who could read and write, or at least could read writing." For the next 20 years the financial position still gave rise to continual anxiety. This was relieved somewhat by the institution of a Hospital Sunday in 1868, and a Hospital Saturday in 1877. Additions to the original building from then onwards have had to be made at frequent intervals in order to cope with the increase of work.

In 1872 a detached block, consisting of four large wards and connected with the main building by a subway, was opened for "the isolation of contagious diseases and offensive surgical cases." In 1883 an out-patient building was built, equipped and opened. In 1887, in commemoration of the centenary of the infirmary, many additions were made, including a detached "home" for the nursing staff, ophthalmic wards, laundry, mortuary and post-mortem rooms. A new general theatre was also added, and the out-patient department was enlarged. In 1911 the exigencies of the growing population of the city and vicinity were met by the erection of another surgical block containing 215 beds. Again in 1921 alterations were made to existing buildings to increase the bed accommodation, and on August 8th, 1925, Princess Mary opened a new "ear, nose and throat" department, and in 1926 a new residency was opened (Fig. 2).

The number of beds available at the infirmary when it was first opened in 1797 was between 100 and 110. At the present time there are 500.

FIG. 2.



Sheffield Royal Infirmary, 1930. The original building is seen in the central part of the picture.

FIG. 1.

General (now Royal) Infirmary, Sheffield: the original building, 1797.

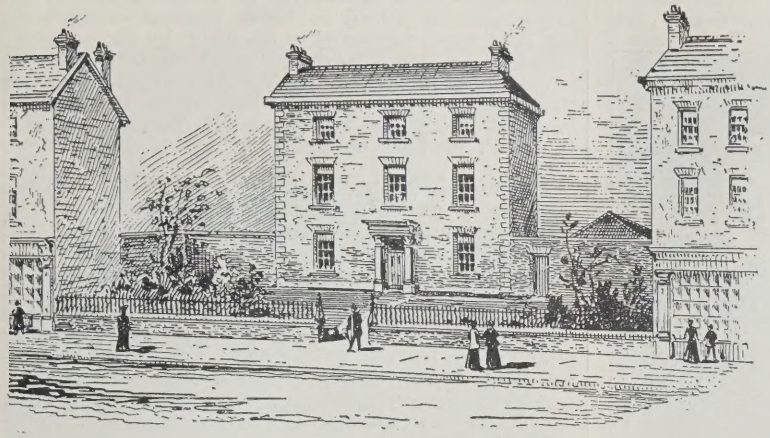
The Royal Hospital.

The present Royal Hospital began as a dispensary in 1832, occupying small premises in the centre of the town. The promoters (in this case a group of medical men) had previously approached the board of the General Infirmary suggesting that the dispensary should be attached to that institution. This, however,

was declined, chiefly through the active opposition of one of the latter's physicians. The work increased rapidly and the dispensary soon wanted larger premises. A house in West-street was bought, on and around the site of which the present building stands (Fig. 3).

It continued as a dispensary with little or no change for the next 25 years. In 1854 three physicians were

FIG. 3.



Westfield House, the Public Dispensary, forerunner of the Royal Hospital.

appointed. This election proved the turning-point in the future development of the institution. Owing to the energy and influence of the senior of the three, Dr. John Charles Hall, the dispensary was rebuilt as a hospital with 25 beds in 1860, and ten years later this was enlarged to 100 beds. It was now officially recognised as a teaching institution, and from that time onwards became connected with the medical school.

The work of the new hospital increased rapidly, so that in 1889 it was found necessary to rebuild on a larger scale. The first blocks of the present buildings were completed and opened in 1895 (Fig. 4) by His Majesty the King, at that time Duke of York, permission being given for the institution to be called the Royal Hospital.

In 1914 the present block of buildings was completed. Since then no actual new buildings have been erected on the site, but various means have been obtained to increase the accommodation. Thus in 1908 a convalescent home or annexe in the suburbs was given. Residential quarters have been obtained in the outskirts of the city for most of the nursing staff, and lastly, in 1925, a former chapel adjoining the hospital site was converted into a new out-patient department. As the hospital grew the dispensary dwindled, until, about the beginning of the century, it ceased entirely.

The Royal Hospital now has 340 beds.

Jessop Hospital for Women.

The foundation of a women's hospital in Sheffield dates from 1864. This again was largely due to the efforts of a medical man, Dr. J. H. Aveling, who took an active part in its work for some years. It was called the Sheffield Hospital for Women. A large house in the centre of the town was adapted for the purpose, situated in what had once been a residential quarter (Fig. 5). It consisted of six beds and an out-patient department. Fourteen years later in 1878, owing to the generosity of Mr. Thomas Jessop, the present hospital was built, and henceforward known as the Jessop Hospital for Women.

Since then considerable additions have been made to the original building in order to cope with increasing demands (Fig. 6). Outside accommodation has been obtained for the nursing staff. In 1926 Norton Hall, a mansion situated in a large park on the hills outside the city, was converted into an open-air annexe, partly for the treatment of cases of puerperal sepsis and partly for antenatal and gynæcological cases.

At the present time the hospital and the Norton annexe contain 145 beds for gynæcological, obstetrical, and antenatal cases. There are also extensive out-patient departments. The hospital is recognised for the instruction of medical students and midwives.

Children's Hospital.

This, the youngest of the four voluntary hospitals in Sheffield, was founded in 1876 by the activities of the late Dr. W. J. Cleaver. A few years later the present buildings in Western Bank were built, at which there is in-patient accommodation for 86 children together with an out-patient department. A new block of wards has recently been added and further additions are being made (Fig. 7). There is also an out-patient department in the east end of the city.

Medical School.

As the medical school was founded in 1828 it is thus seen that for the first 40 years of its existence there was only one clinical institution connected with it. From 1870 onwards there were two, which for the next ten years were rivals for the student's

FIG. 4.

Sheffield Royal Hospital, 1930.

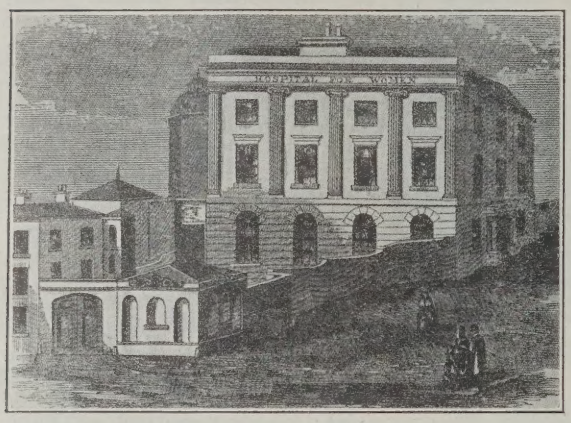
Photograph by Yates and Henderson.

favours. This was so unsatisfactory that in 1880 it was agreed by the staffs that the two should in future coöperate for purposes of clinical instruction, under the control of a committee composed of three representatives appointed from each. The student now paid

one fee for general hospital practice, and could attend at each or both as he chose. Two clinical lectures per week were given by members of the staff during term at one or other place, and attendance on these was compulsory for all students. In spite of many early difficulties this joint arrangement continued.

About this time the Jessop Hospital for Women became recognised as a maternity centre, and the students began to attend their cases there. It was

FIG. 5.



Sheffield Hospital for Women, Figtree-lane, 1864.

managed independently by the hospital, and the clinical committee had no control over it. Indeed it was not until 1908, three years after the foundation of the university, that the Jessop Hospital joined the two general hospitals, and the original clinical committee became a committee of the council of the university. On this, in addition to representatives of the staffs, the dean of the medical faculty and various university representatives, both medical and lay, are appointed. More recently the Children's Hospital has joined the scheme.

This committee is responsible for the organisation of all clinical teaching both general and special. The student pays one inclusive fee to the university which covers all forms of hospital practice required. A definite scheme of study is laid down. Clinical appointments must be taken in certain rotation and equally distributed between the institutions concerned. On the other hand, the student is allowed a free choice as to the actual member of the staff under whom he wishes to hold each appointment. For some years the Faculty of Medicine has tried to bring the earlier laboratory subjects, anatomy and physiology and the later clinical studies more closely together. This although most desirable in theory is not easy in practice. Even after an extended trial the method adopted has not met with the universal approval of the staff, and there are those who consider that the objections outweigh the advantages.

The general plan adopted in 1919 was as follows :—

(*a*) To shorten the pre-clinical studies of anatomy and physiology by holding a second M.B. examination at the end of the second year.

(*b*) To start the clinical studies earlier—viz., at the beginning of the third year.

(*c*) To make further laboratory studies of anatomy and physiology run alongside the earlier clinical studies during the whole of the mid-period of the curriculum—i.e., from the beginning of the third to the end of the fourth winter, when at the third M.B. examination, anatomy, physiology, pharmacology, and pathology are all taken together.

N.B.—For this para-clinical instruction in anatomy and physiology three hours a week are assigned for each subject during the third and fourth winters, two-thirds of which is devoted to practical work in the laboratory.

In 1929 the curriculum was lengthened from five to five and a half years, and some rearrangement in the students' work in these subjects was made, but the general principle outlined above was retained.

The teachers of the pre-clinical subjects favour it. They say that it stimulates interest in the laboratory studies by giving the student an insight into the application of these to clinical work. Amongst the clinical teachers opinions differ.

Special Studies.

During the last few years the opportunity for acquiring a fuller knowledge of mental diseases, the importance of which is being realised everywhere, has been much increased in Sheffield by the coöperation of the South Yorkshire Mental Hospital and the two general clinical hospitals. At each of the latter there is now an out-patient clinic for mental diseases in direct association with the South Yorkshire Mental Hospital, medical officers from which assist in its work.

Although it is not immediately concerned with the teaching of students, reference must be made to the experimental field laboratory at Redmires, connected with the department of pharmacology of the university. The quality and quantity of experimental work carried out there during the last ten years by Prof. E. Mellanby, to say nothing of the well-known researches of Mrs. May Mellanby, have not only placed them both in the forefront as original investigators, but have also exerted a wide influence for good over every department of the Faculty of Medicine, and brought renown to the university as a centre of medical research.

Connected with the Faculty of Medicine there is also a flourishing dental school. Begun in 1895 in connexion with the Royal Hospital, it was actually a complete teaching department in 1900. It has fully equipped laboratories for dental mechanics in

FIG. 6.

Jessop Hospital for Women, 1930.

Photograph by Pawson and Brailsford.

the university buildings, and at the Royal Hospital there is a large dental clinic which was entirely refitted and equipped two years ago.

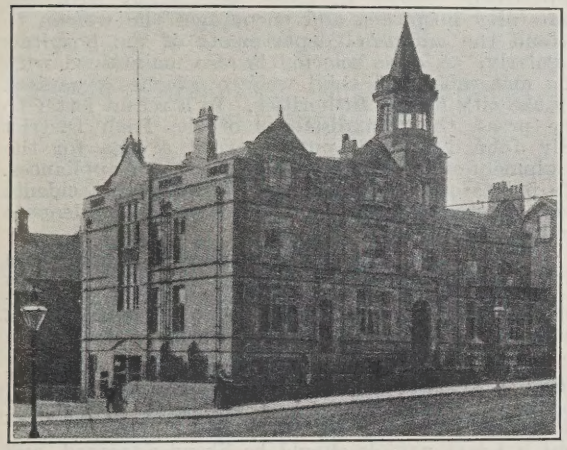
Up to the time of the late war, although the staffs of the four hospitals had been thus acting together for purposes of clinical instruction, yet the institutions themselves remained as distinct and isolated from each other as on the days they were founded. Indeed, not infrequently the joint clinical committee has had to step warily in order to avoid giving offence. During the war, however, members of the various hospital

staffs worked daily side by side with each other, and when the war was over they felt that this joint working was something worth trying to preserve.

Joint Hospital Staff Club.

With this object the members of the staffs of the four voluntary hospitals formed themselves into a joint hospital staff club, of which everyone on election to one of the honorary staffs becomes, ex-officio, a

FIG. 7.



The Children's Hospital, Sheffield.

member. The club has a business side and a social side. Thus, on the one hand it forms a body before which all matters affecting the honorary staffs as a whole, or any one of them individually, can be brought up and discussed. Since its formation it has helped to solve many problems which have from time to time arisen, and, without it, might easily have caused considerable difficulty. Its social side has also proved of great value in bringing the members of all the staffs into frequent contact with each other, promoting friendships, and removing misunderstandings.

This apparently unimportant arrangement has had far-reaching and unexpected effects. In the first place it suggested the idea that the four voluntary hospitals themselves might with advantage come closer together, indeed that they might really become one institution. As a result of a joint memorandum sent out to their various boards by the staff club, this idea was brought to a head, and the four boards and staffs did actually meet to consider the suggestion at the invitation of the then Lord Mayor.

Joint Hospital Council.

Once the ice was broken, the boards of the four hospitals began to come regularly together. The most important immediate effect was connected with the financial side, and resulted in the formation of the "penny-in-the-pound" scheme, the development of which has greatly altered local hospital conditions. Apart from the merits or demerits of the scheme as a whole, it has aroused a widespread local interest in the voluntary hospitals, and incidentally has since its formation produced a million sterling in aid of the hospitals. This scheme is controlled and organised by a body known as the joint hospital council, which in addition to having representatives of the boards and staffs of the four voluntary hospitals, has also representatives of the Edgar Allen Institute, of the contributors' association, and also various ex-officio members. Its chairman since its formation has been the Vice-Chancellor of the University (Sir Henry Hadow). Each hospital board still controls the domestic affairs of its own hospital, whilst the joint hospital deals only in a consultative and advisory capacity with the many questions which are common to all.

Soon after this coöperative movement began, the idea was entertained of building one large joint hospital, situated on the outskirts of the city, and transferring the four existing hospitals there. The scheme got so far that a suitable site was bought for the purpose. Meanwhile a period of serious and unexpected depression in the coal and steel trades, the two staple industries of the district, made any early realisation of this costly scheme impossible. It was hoped that in a few years a revival of trade would ensue. These hopes have not as yet been realised, and it has become obvious that under even the best circumstances it will be a very long time before such a costly undertaking will be possible.

As has been mentioned above, the hall situated in the grounds of the purchased site has been rented to the Jessop Hospital for Women, and converted into an annexe for septic maternity cases. This has proved very valuable for its purpose.

Future Possibilities.

With the coming into force of the Local Government Act of 1930, the possibility of providing the required accommodation on different lines has presented itself. The larger of the two poor-law hospitals in Sheffield is conveniently situated on the outskirts of the city in a large area of ground. It has a large number of beds, some excellent wards, and space enough on which to add anything further that may be required.

It seemed therefore possible to those concerned that, if the city council were willing, joint action might be taken by the voluntary hospitals and the council, and the requisite relief to the waiting lists of the voluntary hospitals obtained by providing sufficient extensions at this municipal hospital. With this object, an advisory committee, composed of equal representatives of the municipality and the voluntary hospitals, has been appointed, and has agreed upon certain general principles under which such joint action could be carried out.

At the present time these negotiations are not yet complete, but it may be said that, so far, there has been an obvious desire on both sides to work together and that such difficulties as have arisen have been met in a spirit which promises well for the future. Should the scheme materialise there is every possibility that all the institutions for the treatment of the sick in the city will be working in close coöperation not only with each other, but also with the university.

A highly satisfactory note can be added as to the relations of the faculty of medicine and the staffs of the voluntary hospitals to the medical officers of the various city hospitals, and also to the medical practitioners of the city and district. Of the former, all those holding official posts dealing with subjects required by the curriculum have in the past successively joined the staff of the faculty and rendered invaluable services. The chair of hygiene has been filled by successive medical officers of health; the lectureship on forensic medicine is held by the city police surgeon; infectious diseases and tuberculosis are dealt with by the respective municipal medical officers at the head of each of these departments.

As regards the relations between the medical men practising in the city and district and the faculty of medicine, it is perhaps enough to say that in 1920 the panel committee of Sheffield voted a sum of £1000 to the university towards the equipment of the new field laboratory for its department of pharmacology.

FIRE AT A FEVER HOSPITAL.—On Monday last week a fire broke out at Lodge Moor Fever Hospital, Sheffield. The medical staff and the male nurses got the flames under control by the time the fire brigade arrived, and the damage was confined to the roofs of the wooden buildings.

MEDICINE AND THE LAW.

Alleged Neglect to Give Proper Medical Attendance.

AT Bodmin assizes on June 14th a man named Snow was charged with the manslaughter of his wife by neglect to give her proper medical attendance. She had been ill, it appeared, for a long time. Counsel for the prosecution suggested that her need of medical attention must have been apparent to the husband. A doctor who had attended the woman gave evidence that after some time she objected to his advice, and he then put the district nurse in attendance. The nurse stated that, after she had attended the patient a little while, the husband told her that there was no need for her to come again, as everything was being done that was necessary. It was alleged that eventually, when his wife was getting worse, the husband asked the doctor to examine her. The doctor ordered her immediate removal to the infirmary and there the doctors and nurses were horrified at her condition. She died soon afterwards. Mr. Justice Swift told the jury that he was unable to understand why the doctor and the district nurse ceased to attend the woman who was consequently left in the sole charge of the husband and a feeble-minded daughter. It was for the jury to say whether such neglect as there was could be brought home to the accused. The jury then found Snow "not guilty," and he was discharged.

Earlier in the day the learned judge had expressed surprise that Snow had been singled out for prosecution. If any charge were to be proceeded with, he said, others should be in the dock with the accused. Later he asked why the daughter, the doctor, or the district nurse was not included in the charge. This was no doubt a rhetorical question. Every judge has been an advocate in his time, and he properly employs the art of the advocate to secure acquittal where he thinks that justice requires a verdict of "not guilty." There is no need to take too seriously the suggestion that the doctor and the district nurse should have been prosecuted for the poor woman's manslaughter. They did not cause the neglect to which death was due. The doctor whose advice is rejected and the district nurse whose services are refused cannot be held criminally responsible for that rejection or refusal. The doctor has no power to enforce a course of treatment. If he attempted to do so, nobody would be more ready than His Majesty's judges to point out his error.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Ambulance Work in Ireland.

THE Dublin Ambulance and Nursing Divisions of the St. John Ambulance Brigade in Ireland had their annual inspection last Saturday in Merrion-square in glorious weather. The Brigade in Ireland has shown no sign of inertia following on the war period, but having performed notable service both during the war, and subsequently during the troubled times in Ireland, has now thrown its energy into social services useful in peace time. It trains men and women in first-aid, and women in home nursing. It supplies skilled first-aid workers to attend theatres, picture houses, and other places of amusement, as well as horse and motor races and public functions in general. A year ago when some quarter of a million people assembled in the Phœnix Park for the celebration of the anniversary of Catholic emancipation, the entire ambulance arrangements were carried through without a hitch by the St. John Ambulance Brigade. In addition to this ambulance work proper the Brigade (in cöoperation with the British Red Cross Society) maintains the Hospital Supply Depôt founded during the war, its gifts being now devoted to the patients of the Queen's Institute of District Nurses. During the year some 70 bales of dressings were supplied gratuitously to the district nurses throughout Ireland. Invalid requisites are also supplied to poor patients, or on very easy terms to those who cannot pay much. The welfare department gives free dinners daily to some 70 destitute expectant or nursing mothers, and when a child is born baby-clothes are given. Many of the women attending this department would be on the verge of starvation were it not for the food there given them. The department works in close association with the maternity hospitals, and encourages the women to attend the antenatal departments of the hospitals regularly. A close relation is also maintained with the maternity and child welfare schemes organised by the city health authorities. In a recent letter to the press, the Commissioner of the Irish District (Sir John Lumsden) puts forward a plea for the equipment of motor transport with first-aid appliances. He points out the increasing frequency of accidents due to motor transport, and the necessity for adequate first-aid treatment.

"The results of many crashes are grave enough, but even graver are the aggravated injuries caused by injudicious handling of victims by well-meaning but untrained bystanders. Every facility exists for the acquisition of a knowledge of first-aid, and everyone should possess it."

Sir John suggests: that all 'buses and trams should carry a first-aid box, with dressings, restoratives, iodine, &c.; (2) that all drivers and conductors should be trained to render first-aid; and (3) that all A.A. and R.I.A.C. patrols should be likewise trained, and carry first-aid material.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The New M.O.H. for Edinburgh.

THE town council of Edinburgh have appointed Dr. John Guy as medical officer of health for the city, in succession to Dr. William Robertson. A graduate of Glasgow University, he has been tuberculosis officer and assistant medical officer of health for Edinburgh for 16½ years. His clinical experience has been various, being gained especially as medical superintendent of the sanatorium, the orphanage, and epileptics' colony at Quarrier's Home, Bridge of Weir. His main experience has been in dealing with tuberculosis; but he also had an active part in the public health administration during and after Dr. Maxwell Williamson's time.

Edinburgh is now face to face with a group of the most difficult problems in administrative medicine, including not merely the readjustment of school health administration, and the work of the transfigured poor-law, but particularly the correlation and development of hospital services. Dr. Guy is credited with very definite views on hospital policy, but public opinion is ripe for drastic changes, and the use he makes of his opportunity will be watched with keen interest.

Measles in Edinburgh.

This summer measles has become formidable in Edinburgh. As early as January, and even in December, small numbers of cases were notified; but they began to rise rapidly towards the end of March, when 104 cases were intimated. At the same period the notifications in Glasgow, Dundee, and Greenock had risen into hundreds per week. For the five weeks in April the Edinburgh numbers were 158, 191, 282, 419, and Dr. Guy reports that the epidemic, which started in the Canongate and spread through every district in the city, is the worst that Edinburgh has known for many years. During the first two weeks of June 1401 cases were notified, and since March of this year the disease has visited over

4000 homes representing some 8000 cases. Twenty-one deaths have been attributed to measles in the last fortnight.

It is suggested that the normal two-yearly visitation was missed last year and that the susceptible material is accordingly much greater. Glasgow had its usual winter and spring epidemic, but this has now tailed off. There is nothing to indicate that this epidemic shows the peculiar virulence of the great epidemic of 1893–94 and the lesser epidemics of the years following. It was then commonly said by the doctors that, when called in, they had usually to sign the death certificate. Two, three, and four deaths in a family were relatively common.

LISTER INSTITUTE OF PREVENTIVE MEDICINE.

REPORT OF GOVERNING BODY FOR 1930. CHANGES IN THE STAFF.

THE names of Sir Charles Martin, F.R.S., and of Prof. A. Harden, F.R.S., are so closely and so honourably associated with the Lister Institute of Preventive Medicine that the news of their approaching retirement, on reaching the age limit, will be received with regret throughout the scientific world. In the annual report of the Institute which has just reached us the governing body pay tribute not only to the scientific distinction but also to the high administrative ability of Sir Charles Martin, who has been director of the Institute for 27 years. Prof. Harden, whose researches into the chemistry of alcoholic fermentation were recognised last year by the award of the Nobel prize in chemistry, has served for even longer (33 years), and as head of the department of biochemistry he has played an important part in the scientific development of the Institute. The governing body are fortunate in being able to fill the vacant appointments by men who have not only the requisite scientific standing, but who have had long experience in association with their predecessors. Prof. J. C. G. Ledingham, F.R.S., who becomes director, joined the serum department of the Institute in 1905, and when his chief, the late Dr. George Dean, was transferred to the bacteriological department, Dr. Ledingham followed, and in 1908 succeeded him as head of the department. Mr. R. Robison, D.Sc., F.R.S., who will have charge of the department of biochemistry from January of next year, has been on the staff of the department since 1912, and its first assistant for over ten years. He was made a Fellow of the Royal Society this year for his researches on ossification, which revealed the enzyme (phosphatase) as an active agent in this complicated process.

Other changes of staff include the resignation of Dr. T. W. Lumsden, Mr. E. Boyland, and Miss M. H. Roscoe, on receiving other posts, and the attachment of Mr. R. R. McLaughlin, M.Sc., Ph.D., and Miss A. M. Copping, M.Sc., to the departments respectively of biochemistry and experimental pathology.

The governing body record appreciation of the continued coöperation which the Institute has enjoyed with other scientific bodies whose financial support, by the provision of the salaries of skilled investigators working in different departments, has greatly increased its scientific activities.

DEPARTMENT OF BACTERIOLOGY.

The researches carried on in this department include the experimental production by Dr. G. F. Petrie of potent serum derived from the successful immunisation of a horse with vaccinia virus. Potency tests with the concentrated serum are being carried out by Prof. Ledingham, and its content of antiviral substance proves to be large. In view of statements to the effect that some cases of post-vaccinal encephalitis have benefited by the administration of serum from convalescent vaccinees it is proposed to offer the serum for trial in such cases. Its value in the treatment of small-pox also requires investigation.

Dr. G. H. Eagles is studying the properties of a strain of cow-pox recovered from a vesicular lesion on the arm of a milker. On rabbits and monkeys it produces, after scarification, lesions which differ somewhat from those following scarification with calf-propagated lymph, in the intensity of the associated dermal inflammation and hæmorrhagic tendency. Monkeys vaccinated with this strain fail to respond to small-pox virus recovered from cases of the mild form now prevailing in England. It may be recalled that in 1925 Prof. Ledingham reported the fact that small-pox virus when inoculated intradermally in rabbits produced a characteristic lesion which is neutralised by antivaccinial serum. McKinnon and Defries of Toronto, and Sobernheim of Berne, have recorded similar findings, but so far it has been impossible to secure propagation of the virus from rabbit to rabbit beyond one or two passages. Dr. Eagles is again attacking this problem of adaptation. If a method of propagation succeeds, it may be the means of securing new strains of vaccinia at will from small-pox cases and investigating their properties.

Poliomyelitis and Encephalitis.

Research on poliomyelitis, subsidised by the International Committee for the Study of Infantile Paralysis, includes the study of the path of spread of the poliomyelitis virus in the experimental animal by Dr. R. W. Fairbrother and Dr. E. W. Hurst, who have also investigated a number of cases of post-vaccinal encephalitis, and two cases of a similar condition occurring as a complication of small-pox. It was not found possible to excite nervous lesions in the monkey or the rabbit by intradermal inoculation of ordinary vaccine lymph or neurovaccine of rabbit or monkey origin; on the other hand, intracerebral inoculation of monkey or rabbit neurovaccine was effective in both species of animals. In the monkey the reaction is primarily and mainly meningeal, with secondary changes in the cortex underlying the areas of most severe meningitis. These lesions differed entirely from those of post-vaccinal encephalitis and the characteristic perivascular demyelination of that disease was never reproduced. Virus was present in large amount in the nervous tissues and also in the spleen, which was the seat of marked alterations. Smaller amounts were present in various other organs

The cases of paralytic accident arising in the course of antirabic treatment have sometimes shown a histological picture closely resembling that in post-vaccinal encephalitis. Many observers have ascribed these accidents to the toxic action of the foreign brain material introduced during treatment, and have claimed, usually without adequate histological control, to have reproduced the condition in experimental animals, particularly rabbits. Dr. Hurst has made inoculation experiments designed to test the importance of these observations, if confirmed, in throwing light on the causation of disseminated encephalomyelitis. He concluded that while paralysis might occur in the rabbit injected with foreign nervous substance, such paralysis could not be brought into relationship with the paralytic accidents in man and that the histological picture seen in man could not be reproduced in rabbits by such means.

With Dr. Fairbrother, Dr. Hurst has started experiments to determine whether coincident infection with vaccinia has any power to modify the reaction of the central nervous system to poliomyelitis.

Immunising Properties of Bacteria.

Studies on antigenic constitution and immunising properties of bacteria have been continued by Dr. J. A. Arkwright, F.R.S., and under his direction by Miss R. M. Pitt and Dr. N. C. Graham. Dr. H. L. Schütze, continuing immunity studies in mice, has shown that only the O or somatic content of the bacterial vaccine is capable of conferring protection

against *S. aertrycke* and *S. enteritidis* infections. The presence or absence of H or flagellar antigen in the vaccine is without effect on the prophylactic value. An efficient vaccine may be prepared from an alien species so long as the somatic antigen in each is identical. For example, a *paratyphoid* B vaccine will protect against an *aertrycke* infection and *typhoid* vaccine will protect against a *Gaertner* infection.

Dr. Muriel Robertson and Dr. A. Felix have tried to produce passive protection against anaerobic infections by antibacterial (anti-O) sera. The anti-O serum was found to be strictly specific, affording protection only against infection with *V. septique* of the same serological group. Work is now in progress with *B. tetani* and *B. welchii*, but up to the present the titre of the O immune serum to *B. tetani* has not been sufficiently high to protect mice against infection with spore-calcium suspensions.

It has recently been asserted that tubercle-infected rats on a diet deficient in vitamin A are particularly sensitive to tuberculin, on the ground that the lethal dose of tuberculin for such rats is considerably smaller than that for rats on a similar diet but not so infected. Dr. Schütze and Dr. S. S. Zilva have been able to show that this phenomenon is a purely non-specific one; rats infected with *B. tuberculosis* are hypersensitive to the toxic action of tuberculin, but they are equally hypersensitive to other bacterial toxins.

BCG.

Calmette and his school consider that there is complete safety in using the avirulent strain of the tubercle bacillus known as BCG as a living inoculum for prophylaxis against tuberculosis, since the strain has completely lost its virulence for man and laboratory animals. Dr. Moti Malkani, of Karachi, India, working in this department with a strain obtained from the Pasteur Institute, has come to the conclusion that the virulence of the strain is not completely gone, and that when introduced into the less resistant animals it may be capable of causing widespread and even fatal infection. Some 28 guinea-pigs and 18 rabbits were inoculated by various routes. Of these animals 18 showed extension of infection beyond the site of inoculation to glands and other organs. In one of them the lesions were particularly pronounced and of a caseous nature. Two guinea-pigs died, to all appearances, as the result of infection with BCG. The report adds: "This strain, therefore, though much attenuated, cannot be regarded as avirulent for laboratory animals. It will depend on the degree of resistance it meets with in the animal whether it disappears from the system or leads to a process that may terminate fatally."

(To be concluded.)

LONDON HOSPITAL MEDICAL COLLEGE.—Prizes will be distributed at this college on Tuesday, June 24th, at 3 P.M., by Lord Rayleigh.

QUEEN CHARLOTTE'S MATERNITY HOSPITAL.—The isolation block, the first portion of the new hospital at Hammersmith, will be opened by Princess Mary on July 10th. The annual report states that on many occasions during the past year the hospital was overcrowded, and patients presenting themselves with orders of admission had hastily to be accommodated elsewhere, while others wishing to come in had to be refused. Of the 2360 patients, 2151 were "booked" and 209 "emergency" cases. Of the booked patients seven died, being at the rate of 3·2 per 1000, but there were nine deaths among the emergency patients, a rate of 43 per 1000. Moreover, in booked cases the infantile death-rate was only 25 per 1000, while in emergency cases it was 153 per 1000. The pressure upon accommodation has become so acute that the committee has converted an empty house on the Hammersmith site into an auxiliary hospital with about 20 beds, which will probably be ready next month. It is hoped that it will now be possible for every patient to receive an anæsthetic during her confinement. When the new buildings are completed Queen Charlotte's will be the largest maternity hospital in the Empire with at least 358 beds, of which between 80 and 100 will be in private paying wards for middle-class patients of small means.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1929 statistics of an English and a Scottish county, of a metropolitan borough, and of two modern colliery districts.

Name of district and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Wiltshire .. (300,300)	14·9	12·5	0·59	1·65	1·9*	2·6	55/—	—	6·0
Roxburghshire (19,492, landward area)	15·9	13·7	0·36	1·63	1·7	2·7	71/39	23	0·0
Stoke Newington.. (50,040)	16·1	13·4	0·94	2·04	2·6	2·6	47/26	17	4·9
Doncaster R.D. .. (44,680)	26·7	10·9	0·90	0·56	2·6	1·5	88/—	—	7·5
Adwick-le-Street U.D. (19,230)	23·3	11·1	0·94	0·64	3·5	1·0	131/—	—	2·2

* This figure would probably be about 2·0 if "other respiratory diseases" were included.

Registered stillbirths per 100 live births: Wiltshire 4, Stoke Newington 3·8, Doncaster 4·6, and Adwick-le-Street 7·1.

Wiltshire.

Dr. Claude E. Tangye says that, apart from a large amount of preparatory work in anticipation of the Local Government Act, the year has been an eventful one. A permanent women's ward has been built at Harnwood tuberculosis hospital. The old Trowbridge cottage hospital has been purchased for clinic purposes. The county small-pox hospital at Ogbourne was progressively enlarged to cope with the small-pox outbreak, which only ceased at the end of the year. The county pathological work has, with great advantage, been concentrated at the Salisbury infirmary. In continuation of the policy of appointing whole-time local medical officers for county purposes, Dr. Jean Murray, M.O.H. for Trowbridge and Bradford urban and rural districts, has been appointed an assistant county M.O.H. The scheme for better supervision of pre-school-children has progressed, and arrangements are being made to secure more continued treatment at the venereal disease centres. The public medical services are being coördinated in such a way that the new responsibilities under the Local Government Act will be met by simple and natural development of the county health department. Progress has been made in pooling infectious hospital accommodation by the closure of the Cricklade and Wootton Bassett hospital and an arrangement for the cases from this area to be admitted to the Swindon hospital. Swindon is badly off for a general hospital, and the county council proposes to utilise a poor-law institution at Salisbury for non-notifiable diseases and to establish a subsidiary unit at Swindon.

The rainfall was more than three inches less than in the previous year and there was a shortage of water in many districts during the dry summer. The summary of analysts' reports shows that of 30 effluents from sewage disposal systems in six rural districts the effluent was definitely bad; of these three were in Chippenham, two in Pewsey, and one in Tisbury. Five were described as poor; one being in Swindon, two in rural districts—Bradford-on-Avon and Devizes

—two in War Office schemes at Enford and Netheravon. The remaining effluents were mostly described as good or fair. During 1929 901 new houses were built, of which 346 were erected by local authorities and 302 with State assistance by other enterprise. At the 1921 census there were 66,874 houses, and since then 8800 new houses have been erected, of which 3390 were built by local authorities, 3622 by other enterprise with State aid, and the remainder without State aid. The borough of Malmesbury is the only authority which has not erected houses. Since the passing of the Housing (Rural Workers) Act, 1926, 150 applications have been dealt with. At the end of 1929 financial assistance amounting to £5438 had been promised for 67 premises; £2621 had been paid for 29 premises completed; and work on 5 other houses had been completed and was in hand in 20 other instances.

The notifications of tuberculous milk, produced in Wiltshire, from outside authorities numbered 43, mostly from the L.C.C. As the result of the follow-up 25 cows were slaughtered under the Tuberculosis Order, and the udder was found to be affected in 23. Another cow was sold for slaughter before the biological examination was completed. The county veterinary surgeon had frequently to resort to group sampling and repeated visits before finding the offending cow and in several cases the investigations were not completed at the end of the year. Of the 223 samples taken by the Sale of Food and Drugs Act inspectors for the purpose of the Milk and Dairies Order, 23 were found to be tuberculous and in the follow-up 17 tuberculous cows were slaughtered and the udder was found to be infected in all but two. Among the 155 small-pox cases notified there were several severe cases but none ended fatally. No case of small-pox was notified during the first three months of 1930 and it is hoped that the epidemic is now over. In September a conference was held between Dr. Tangye and the medical officers of the isolation hospitals on the problem of "return" cases of scarlet fever. The conclusions reached were:—

That separate wards should be provided for uncomplicated cases and for cases complicated by nasal and other discharges; that there should be single-bed observation wards in every hospital; that the cases should be selected for admission by the medical officer of health alone so as to avoid overcrowding of wards and the refusal of urgent cases later on in an epidemic; and that the services of ear and throat surgeons should be made available.

Certified midwives attended two-thirds of the births in the county and sent for medical help in 34 per cent. of their cases. The county council pay two-thirds of the expenses of a two months' post-certificate course for midwives. The standard of antenatal work by midwives has decidedly improved and all the trained midwives keep satisfactorily the records required by the Central Midwives Board.

Roxburghshire.

Dr. M. J. Oliver, in submitting his thirty-fifth annual report for the county (four were omitted during the war period), considers an active health authority should be the best judge of how to tackle problems within its own district, and he complains that the efforts of the staff are frequently turned in a new direction before their work is satisfactorily completed. In his county he would, at the present, put first the making effective of the excellent dairy by-laws. He would put housing second and in the landward districts the extension of work under the Housing (Rural Workers) Act. Thirdly, drainage work requires greater supervision in both burghs and landward districts. The county nursing association does good infant visiting work restricted, however, to its members, and this work should be extended. Finally, there is a great waste of sanitary work, such as inspection of houses, water-supplies, and dairy farms, without any improvement following. The local authorities possess the power and the sanitary administration should be tightened up.

In the last annual report it was mentioned that the Kelso district committee had taken over the Ednam water-supply scheme from the proprietor. The works for distribution appeared to be in excellent order. Subsequently complaints were received as to the quality of the water. Analysis of a sample showed a high degree of pollution. There being no other source of supply, the water was at once chlorinated and steps were taken to have the ground opened up, when much pollution from drains was found, including the effluent from a septic tank. The excavations will be continued in the hope of rendering the source safe for public use. There has been so much activity under the Housing (Rural Workers) Act that the staff have been unable to devote attention to the inspection required by the Housing Regulations, 1928. 177 applications were approved under this Act and the work was completed at 111 houses during the year. The control of infectious diseases in the south-east counties of Scotland is discussed in an interesting manner and Dr. Oliver particularly emphasises the fact that removal to an isolation hospital is a preventive of very small value indeed in scarlet fever unless it is backed up by subsidiary measures.

Dr. G. F. B. Page, clinical tuberculosis officer, describes how the county tuberculosis scheme has been gradually built up since 1920. He particularly insists that the first essential of a tuberculosis scheme is to have it carried out by a man with real experience of tuberculosis and not by an "omnibus" medical officer who has all sorts of other duties to perform. Experienced practitioners cannot be expected to consult young tuberculosis officers with no more time and knowledge at their disposal than the "omnibus" medical officer can claim. A table giving the tuberculosis death-rates in Scottish counties during the last six years shows that the Fife and Roxburgh rates have steadily declined whilst the rates in the other counties have mostly remained stationary. Under the Tuberculosis Order nine cows were slaughtered under police direction. All were suffering from tuberculous emaciation and eight were cows in milk.

Dr. Oliver comments on the very shortsighted policy of farmers only summoning veterinary assistance when all the harm possible by infection has been done. He also remarks on the great difference in the feeding of the milk cows in the various districts as reported by the four veterinary inspectors. With such wide differences in feeding it is very unlikely that all are equally economical, and he inclines to think that here is an opening for the veterinary profession to exert a beneficial influence.

Stoke Newington.

Dr. F. D. Ross-Keyt says there has been no extension of the public health services in this metropolitan borough, but those in operation continued to progress favourably. In October, 1928, the council approved a scheme for the appointment of a panel of four obstetrical consultants, who may be called in by medical practitioners in difficult midwifery cases. The following are the conditions: that the patient be a Stoke Newington resident; that the medical practitioner immediately inform the medical officer of health as to the particulars of the call; and that the consultant's fee of £5 5*s*. be inclusive. The scheme is intended for the use of persons who cannot afford the consultant's ordinary fee, and the council reserve to themselves the right to recover the fee if the patient's circumstances permit. Only one consultation took place under the scheme during 1929. This was a case of puerperal pyrexia which was removed to a fever hospital and recovered. There were fewer L.C.C. houses available during 1929 and only 17 families were removed from Stoke Newington as compared with 36 in the previous year. Of these two families went to the Lewisham estate, eight to the Hendon estate, and seven to the Becontree estate. Many desirable tenants are unwilling to travel the distances to and from work necessitated by the removal. Others living in an overcrowded state cannot

be recommended owing to poverty or low standards of cleanliness. Twenty-two tenants who had recently had their rentals increased applied for certificates that their houses were not in all respects fit for habitation, under the Increase of Rent, &c., Acts, 1920 to 1923, and in every instance the certificate was granted. Owing to the lack of alternative accommodation cases of overcrowding have to be dealt with leniently.

Immunisation against diphtheria has been carried out on a small scale, and 102 children completed the preliminary cause of three immunising injections in 1929. The number of children protected shows an increase of the previous year's work. Of the 16 notified cases of ophthalmia neonatorum, one who received hospital treatment for some months resulted in permanent loss of vision but it is not mentioned at what stage the case came under hospital treatment. The severe epidemic of influenza during the first quarter chiefly affected the older members of the community.

Doncaster.

Dr. A. B. Dunne says his rural district has never wholly recovered from the coal stoppage in 1926. There are five collieries of the largest class. Work has been irregular and there has been unemployment and distress. Agriculture still employs a large number of men in the district and Messrs. Pilkington have a large glass works. Much of the charm of the district has been spoilt by ribbon building. Industrial atmospheric pollution is on the increase, and the smoke from the collieries adversely affects the trees. The district council has not become a member of the regional smoke committee. About 2500 milch cows are stalled in the district, and amongst these were found 11 cases of tubercle of the udder. Of the 11, two were reported by private veterinary surgeons, one by the owner, and eight were found by the county veterinary surgeons. In addition to the foregoing, 19 cows and two bullocks with tuberculous emaciation, and 22 cows and one bullock with open pulmonary tuberculosis were slaughtered.

Adwick-le-Street.

Dr. A. B. Dunne shows that when the standardising factor is applied the death-rate of 11·1 becomes 13·8. (The use of the same factor in the rural district of Doncaster, it may be noted, made little change.) The water-supply of this urban district is derived from a well sunk in the limestone and softened by the council from 38 degrees to 10 degrees of hardness. The council have had some difficulty with the sand filters of the softening plant resulting in the deposit of much lime in the service pipes. Flooding in the Bentley moor neighbourhood has been lessened by the raising of the bank of the Ea Beck, but Dr. Dunne points out that the flow of water down the beck is still liable to obstruction by a road bridge. The housing conditions are good; in fact, building has ceased and there are approximately 50 empty houses.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 7TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 237 (last week 327); scarlet fever, 1743; diphtheria, 1085; enteric fever, 64; pneumonia, 898; puerperal fever, 39; puerperal pyrexia, 116; cerebro-spinal fever, 14; acute poliomyelitis, 1; encephalitis lethargica, 15; continued fever, 2; dysentery, 2; ophthalmia neonatorum, 92. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 10th–11th was as follows: Small-pox, 434 under treatment, 25 under observation (last week, 449 and 15 respectively); scarlet fever, 2002; diphtheria, 2174; enteric fever, 25; measles, 687; whooping-cough, 73; puerperal fever, 22 (plus 14 babies); encephalitis lethargica, 122; poliomyelitis, 1; "other diseases," 20 At St. Margaret's Hospital there were 17 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox or enteric fever, 54 (12) from measles, 10 (4) from scarlet fever, 20 (4) from whooping-cough, 34 (7) from diphtheria, 48 (15) from diarrhœa and enteritis under two years, and 22 (5) from influenza. The figures in parentheses are those for London itself.

Eight fatal cases of measles were reported from Southampton, 6 each from Birmingham and Liverpool. Liverpool also reported 6 deaths from diphtheria.

The number of stillbirths notified during the week was 304 (corresponding to a rate of 41 per 1000 births), including 65 in London.

Correspondence.

"Audi alteram partem."

BRITISH MOSQUITOES.

To the Editor of THE LANCET.

SIR,—In your report last week (p. 1312) of a visit paid by members of the Royal Institute of Public Health to our mosquito control laboratory, the writer states that "in most inland places six species of mosquito are found." This statement requires modification; the actual fact being that in most inland places *not more than six* species of mosquitoes are likely to be met with to any appreciable extent. The so-called household mosquitoes, *Culex pipiens* and *Theobaldia annulata*, are common in all parts of the country, the latter being a fierce and poisonous biter. To these we must add eight other common species which breed in inland waters (*Anopheles maculipennis* and *bifurcatus*, *Aedes annulipes*, *maculatus*, *rusticus*, *punctor* and *cinereus*, *Culicella morsitans*), as well as two species which breed chiefly (*Aedes caspius*) or exclusively (*Aedes detritus*) in coastal districts. Since each of the above-mentioned species selects some particular kind of environment in which to breed, it is very unusual for more than three or four species (over and above the two household ones) to be at all prevalent in one and the same locality.

I am, Sir, yours faithfully,

JOHN F. MARSHALL,
Director, British Mosquito Control Institute, Hayling Island.

June 16th, 1930.

"DISCARDED METHODS" IN LARYNGOLOGY.

To the Editor of THE LANCET.

SIR,—In Mr. Lawson Whale's book on modern treatment of diseases of the throat, nose, and ear, reviewed in your issue of June 7th (p. 1238) I find under the heading of Discarded Methods the "complete or partial removal of the uvula" and the "indirect (original laryngoscopic) method" for laryngeal work. It will be a sorry day for certain patients when the shortening of the uvula is discarded. We know that an inordinately long uvula may be present without any symptoms and we know that a cough may coexist with a long uvula and be due to some other cause altogether; but we also know—or, at least, I know—that in many cases a cough is caused by an elongated uvula and is removed at once and, often, for all, by the shortening of that appendage.

As regards the discarding of the original laryngoscopic or indirect method in favour of the direct endoscopic method for laryngeal work, the latter may be much easier for the operator, but it is certainly not easier for the patient, unless under a general

anæsthetic. For the most common innocent new-growth in the larynx—namely, the so-called fibroma on the edge of a vocal cord, at or near the junction of the anterior and middle thirds, the specialist ought to be able to effect the removal by means of the ordinary forehead and laryngeal mirrors and laryngeal forceps, without the paraphernalia of the endoscopic apparatus, and without general anæsthesia. This applies still more to the electro-cauterisation of tuberculous ulcers in the larynx, as it may have to be repeated on several occasions.

I am, Sir, yours faithfully,

London, June 18th, 1930. JAMES DUNDAS-GRANT.

THE CAUSATION OF ECLAMPSIA.

To the Editor of THE LANCET.

SIR,—In his letter last week Dr. Theobald makes it clear that his theory of the causation of eclampsia is that the detoxicating action of the liver fails and that this failure is "because the fœtus requires 8 g. of calcium, and relatively large supplies of sugar, iron and iodine during the last four weeks of pregnancy." It is true that some interference with the intestines from the bulk and weight of the pregnant uterus is also admitted, but these possibilities, as also the psychological trauma, are thrown in as a kind of makeweight. The essence of Dr. Theobald's theory is that the demands of the fœtus for calcium, sugar, iron, and iodine cause the detoxicating action of the liver to fail.

How can this theory account for the greater incidence of eclampsia in primiparæ, and in primiparæ, also, who appear particularly fit right up to the onset of eclampsia? I suggest that the anxieties and psychological trauma are likely to be greater in a woman bearing her seventh or eight child than in a primipara. Mr. Paramore's theory of the increased intra-abdominal pressure, due to powerful and unstretched abdominal muscles causing serious interference with the circulation of blood in both the liver and kidneys and thus impairing their functions, fits the facts far better. Even if the existence of increased intra-abdominal pressure in later pregnancy can be disproved experimentally, could there not be an alternative explanation of the impeded liver circulation—namely, that in pregnancy? One of the changes—not mentioned in Dr. Theobald's list—is the broadening of the base of the chest and the flattening of the diaphragm and a limiting of the up and down movements of the diaphragm. These effects would be greater in proportion as the abdominal muscles were powerful, as in primiparæ, or in proportion as the abdomen were bound in by tight lacing, as in unmarried pregnant women for purposes of concealing their condition.

Thus the important suction action of the diaphragm on the contents of the great abdominal veins would be much diminished and the circulation in the liver and kidneys impeded and their functions impaired. Doubtless, the most important result of such impairment of liver function would be the loss of the detoxicating power.

I am, Sir, yours faithfully,

Bridlington, June 8th, 1930. P. D. H. CHAPMAN.

To the Editor of THE LANCET.

SIR,—Whether Dr. Theobald's conception of eclampsia has been rendered more acceptable by his letter in your issue of to-day (p. 1264) seems to me questionable. I must confess I am not sure now whether he believes the fits are due to toxins of intestinal origin or not. He says that when the liver fails toxins absorbed from the gut enter the general circulation and poison the tissues of the body—"the kidneys as well as the heart." It would thus be reasonable to believe that they poison the brain and even thus produce the convulsions; but Dr. Theobald does not say so, and a definite statement would have helped. His idea that "the fits are probably caused by a sudden drop in the level of the blood-sugar associated with a hypo-calcæmia" (p. 1119) still simmers in the mind.

And especially is this so since, according to his letter, these toxins which poison the kidneys as well as the heart do not apparently poison the liver—at least, they do not occasion the hepatic failure. The liver "fails because the fœtus requires 8 g. of calcium, and relatively large supplies of sugar, iron, and iodine . . . ." (p. 1264)—which suggests an inability of the liver to comply with fœtal demands. But if the fœtal demands should become too great for the mother, fœtal atrophy, not a maternal disaster, should occur. The view put forward in the paper is more reasonable: in that Dr. Theobald attributed the hepatic failure in part to toxins absorbed from the gut. "The liver, carrying out metabolic functions for both mother and fœtus and overwhelmed by an excess of toxins, fails . . . ." (p. 1119). But now, Dr. Theobald not only repudiates or neglects the possible play of these intestinal toxins on the liver, which he has declared are being absorbed in excess; he also denies that increase of work by the liver has anything to do with its failure—which seems incompatible with the conception that its failure is due to fœtal demands. To the question, "whether the failure of the liver is due to overwork, I will answer in the negative" (p. 1264).

In view of Dr. Chalmers's letter and the statement that the intestinal tract of Chinese is swarming with all sorts of unwholesome bodies, coupled with the further statement of the absence of eclampsia amongst these people, it was perhaps well to discount the supposed rôle of intestinal toxins in the causation of eclampsia. The conception creates the difficulty to which Dr. Chalmers referred—that if eclampsia is due to "a breakdown in the defensive barrier to intestinal toxins . . . . such a condition might conceivably arise apart from pregnancy" (p. 1209). Dr. Theobald gets over this difficulty by attributing the failure of the liver to the absorption by the fœtus of calcium. But if that be so, how is it that in China where osteomalacia is common, eclampsia is rare? How is it that in hydatidiform mole, in which there is no fœtus, the liability to the toxæmias of pregnancy and even eclampsia is increased? How is it that in hydramnios the same effect is produced? Are we to believe that the sudden or abrupt distension of the uterus with blood—in concealed accidental hæmorrhage—produces eclampsia by robbing the maternal system suddenly of calcium—when a venesection in the arm may save an eclamptic?

And if a loss of calcium—or an exaggerated absorption of calcium by the fœtus—is the cause of the hepatic failure, why not attribute the failure of the kidneys and that of the heart to the same change? According to Dr. Theobald, the kidneys and the heart are damaged by toxins: but Stroganoff seems to have taught that it is the violence of the fits which damages the heart—during a fit the peripheral resistance is enormously increased, and according to Stroganoff it is each fit which renders the heart worse.[1] It is the physical strain, not a chemical blood change, which in eclampsia damages the heart. In the same way are the kidneys physically damaged by the fits, being rendered worse. The liver is equally involved in the damaging compressions occasioned by the fits. Similarly, it is the physical changes produced by pregnancy, of less intensity but of like nature, which initiate the visceral disturbance. Such a view, naturally enough, must be repugnant to Dr. Theobald; but it is one which a study of some years has done nothing but demonstrate its truth. For Dr. Theobald, the pressure in the abdomen is not increased in pregnancy. One reason for this, from his letter, is plain: "I ought to have said," says he, "that my observations on the pressure in the abdomen were made with the woman flat on her back and under anæsthesia" (p. 1264). What a conception

[1] Jour. Obst. and Gynæc. Brit. Emp., 1923, xxx. See p. 12.

of the intra-abdominal pressure does this aside portray! Naturally, if one anæsthetises the individual, even if the abdominal wall muscles do not become atonic, their tone is greatly diminished. How, from such a base, Dr. Theobald can state that in the active pregnant woman, even during rest—even during sleep, which has not the same effect as anæsthesia—the intra-abdominal pressure is less than atmospheric, and is not increased by pregnancy, surpasses my comprehension. Has Dr. Theobald considered the effect of muscle tone? Does he know that when striated muscle is actively elongated (as, for example, in the case of the abdominal wall and thoracic diaphragm by rapid distension of the abdomen), its tone becomes greater?

I told Dr. Theobald he had burnt his boats: he answers he has built a bridge. But its foundations are incomplete, and its structure contains contradictions. It is a bridge over which scientific thought cannot pass; nor does it seem to be one by which the eclamptic woman may be saved. Even though it should be true that "the injection of saline or air" into the udder of cows affected with *l'éclampsie vitulaire* (as Delmar called it)—a condition in the cow which resembles very closely eclampsia in man, as indeed Dr. Theobald tells us (p. 1264)—should raise the blood-calcium, that is not the reason why the procedure cures the animal. The distension of the udder with air in affected animals has a more subtle effect than that, one which veterinarians, as far as I am aware, have not yet fathomed.

I am, Sir, yours faithfully.

R. H. PARAMORE, F.R.C.S. Eng.

Rugby, June 7th, 1930.

CHEMICAL TESTS OF PANCREATIC EFFICIENCY.

To the Editor of THE LANCET.

SIR,—I think that no one, and least of all those who have had much experience of pancreatic affections, will disagree with Dr. Harrison's statement that there is no specific chemical test for pancreatic efficiency, or dispute his conclusion that the functional tests at present available are frequently equivocal. But this is equally true of chemical tests for the functional efficiency of other organs, and is an inevitable result of the interdependence of the chemical changes which go on in the body. The functions of the pancreas in metabolism, although highly specialised, are so intimately bound up with those of other organs that a sharp differentiation is difficult in practice, and, as a consequence, a diagnosis of disease of the gland can usually be arrived at only by considering the results of as varied and comprehensive a series of investigations as possible in the light of all the available clinical data, as I pointed out many years ago.

It is remarkable that glycosuria and hyperglycæmia are so rarely met with in pancreatic affections, and then mainly in acute lesions and chronic disease involving the whole gland. This may be due, as Dr. Harrison suggests, to a large reserve power, or may arise from other causes, but the absence of these signs in the less acute and more limited conditions does not necessarily mean that the storage and utilisation of carbohydrate are being carried out in a normal manner, in fact, it is exceedingly likely they are not, and that intermediate products of imperfect carbohydrate metabolism appear in the blood and are excreted in the urine in such circumstances. These intermediate products, being of the nature of dextrins, would not react to the ordinary tests for sugar, and would consequently escape detection unless they were specially sought. The detection and estimation of such dextrin-like bodies is the basis of the test with which my name is associated, and, although Dr. Harrison does not apparently use it, I can assure him it is still being regularly employed, in its quantitative form (THE LANCET, 1927, ii., 1386), by other observers as an aid to diagnosis and treatment. Originally devised simply to assist in the clinical differentiation of impacted gall-stones in the common bile duct from malignant disease of the head of the pancreas, it was subsequently found to be helpful in the detection of inflammatory affections of the pancreas arising from other causes, but it was not until a "positive reaction" was proved to be dependent upon the presence of an excess of dextrins in the urine, and a quantitative method for estimating them was contrived, that its uses and limitations were fully defined. It was never claimed to be pathognomonic, and experience has shown that dextrinuria, like glycosuria, may arise from other causes than disease of the pancreas, but, as dextrins appear in the urine at a much earlier stage than dextrose, their detection affords a means for recognising defects of carbohydrate metabolism while they are still of a comparatively mild type. Dextrinuria is also of importance in treatment, since it is an indication that the metabolic powers of the patient are inadequate to deal with the diet he is taking. This is well seen in diabetics who are being treated with insulin, for a dextrinuria usually persists for some time after all traces of sugar have disappeared from the urine, and reappears again before hyperglycæmia and glycosuria develop if the dose of insulin is reduced, or the diet is increased, in such a way as to over-tax the patient's tolerance to a slight extent.

I am, Sir, yours faithfully,

P. J. CAMMIDGE.

Nottingham-place, W., June 16th, 1930.

THE ROTUNDA HOSPITAL.

To the Editor of THE LANCET.

SIR,—I am afraid that your annotation (p. 1301) on the work of the Rotunda Hospital, although accurate, may be a trifle misleading. You mention that there were 963 obstetrical operations performed. As this includes 602 perineorrhaphies, 2 cases of spinal anæsthesia, 11 of Gwathmey anæsthesia, 3 of underpinning the cord, 3 sterilisation (done at the same time as Cæsarean section), 2 venesection, 1 puerperal douche, and 5 Hobbs's treatment, this leaves 333 to be accounted for. These are made up of:—

Forceps	141	Version	20
Induction ..	123	Other manœuvres ..	15
Cæsarean section ..	34		

I feel that the Rotunda Hospital can still claim to be in the forefront of those who believe in conservative methods. I am, Sir, yours faithfully,

BETHEL SOLOMONS,

June 16th, 1930. Master, Rotunda Hospital, Dublin.

LEFT INFRAMAMMARY PAIN.

To the Editor of THE LANCET.

SIR,—Dr. Doris Baker's paper in your issue of June 14th is a welcome addition to communications which seek to differentiate the causes of pain in the region of the left breast. If it assists in preventing those suffering in this manner from being put to bed for six weeks, and from being labelled angina pectoris—one of the terms so terrifying to the public—it will have served a most useful purpose.

Dr. Baker has not attempted to give an explanation of the mode of production of this pain. If a detailed investigation of the submammary region is made, one or more small areas of maximal tenderness is found in the fifth or sixth intercostal space. Pressure here accentuates the pain, induces recognition as *the* pain, and if continued causes radiations of pain in the directions and areas peculiar to that individual. I described some of these areas (THE LANCET, 1921, ii., 1257) under the title the Origin of the Anginal Syndrome, contending that these pains are of muscular origin. In the Lumleian

lectures, 1927 (THE LANCET, 1927, i., 637, 749, 857), I brought forward instances of these muscular pains in various conditions—trauma, pleurisy, gastric distension, static, and functional, &c. A recognition of diversity of causes producing similar symptoms helps to establish a pathology and to indicate a treatment.

The fifth or sixth interchondral space, whichever is the highest space containing an interchondral balk and joint, acts by virtue of that joint, as the hinge of the movement of the lower thoracic ribs 6, 7, and 8 on the upper, hence that intercostal muscle is liable to strain. Such stress arises in the upper thoracic type of breathing seen in functional cases, and in certain cases of failing heart, as well as in the eversion of the lower thorax coincident with affections of the stomach and probably of other organs—e.g., the œsophagus. Strain on this muscle is also caused by static conditions. Lateral spinal curvature, the convexity being to the left in the mid-dorsal region, opens the intercostal space and stretches the muscle. Conditions in which the shoulders are held backwards diminish the concavity of antero-posterior curve of the lower thoracic vertebræ and open the space anteriorly. The former variation frequently follows changes in the level of the crests of the ilium from whatever cause, and the latter such conditions as pregnancy, over-nutrition, myxœdema.

Excessive contraction of an intercostal muscle will also occur in pleurisy, and in the neighbourhood of torn muscle-fibres. If such is in this area pain will be as described. Starting a car has been responsible for several cases, no doubt of rupture of muscle followed by intense pain radiating widely.

Bromide relieves the cases of psychic pain and exaltation of reflexes. Recognition and treatment of the psychological factor requires more than reassurance, and without such fuller mental treatment the abnormal upper chest over-action and irregularity will not be restored to the normal. Amelioration sometimes follows re-education of diaphragmatic action. Treatment of the stomach to obviate flatulence, as by creosote or small doses of calomel and rhubarb and soda, is most valuable. The static cases yield favourably to measures which restore the natural posture—shoes, dieting, thyroid extract, &c. Pleuritic pains, acute or subacute, and trauma yield to measures restricting movement or assisting the action of the muscle.

The most troublesome type to treat is the individual about 50–63. There is no functional element except anxiety to know that the heart is not the cause. These people have reached the period in which calcification of costal cartilages has commenced, entailing more work by interchondral and intercostal muscles. The pain lasts for 18 months to 3 years and then disappears simultaneously with the alteration of the mode of breathing from the thoracic to the abdominal. A chest with a broad epigastric angle is characteristic of this type. Massage to the intercostal muscles is helpful. Successful treatment based on a theory derived from anatomical and physiological concepts goes some way to establishing the correctness of the theory, and I am firmly convinced that the immediate origin of the pain lies in the muscle.

I think Dr. Baker's summary and opinions on treatment are too pessimistic.

I am, Sir, yours faithfully,

CHARLTON BRISCOE.

Harley-street, W., June 18th, 1930.

To the Editor of THE LANCET.

SIR,—The chief impressions I received from a perusal of Dr. Doris Baker's paper were (1) that a cardiological clinic is not the proper treatment centre for patients suffering from this condition, and (2) that the apparent limited amount of material for the study of this condition at these centres reflects a certain amount of credit on the diagnostic acumen of general practitioners.

Pain under the left breast, unassociated with any other symptom, subjective or objective, is the most common of all complaints of pain found in a consulting room (I am writing with the assistance of a carefully indexed study of symptomatology extending over many years), and in association with other symptoms ranks in frequency among the first three pain areas. The pain varies in intensity from a mild discomfort to all the manifestations of a mild primary angina pectoris, apart from situation. Hyperæsthesia is present in a certain number of cases, and the feeling of constriction in some, being due most probably to contraction of the intercostal muscles. Just as pain in the lumbar region is usually associated in the lay mind with kidney trouble, so pain in this region is associated with heart trouble, and that in part may explain its high frequency among patients, but we should unfailingly look for abdominal lesions. It has been found as the outstanding complaint in diseases of the gall-bladder, appendix, uterus, and ovary, and cured by proper surgical interference.

The relationship between hyperæsthesia and gross abdominal lesion, unfortunately, does not appear to be constant, as it has been found absent in some with lesion and present in some where no lesion has ever manifested itself. Its chief associated symptom is constipation, and that may explain why it is more common in women than in men, because constipation is more common in women than in men. It is a mistake to say that "treatment is unsatisfactory." It is all a question of correct diagnosis, for it is found in association with so many different causes, but, failing evidence of definite disease, the most efficacious treatment is "Mist. alba." Why this should be so effective as compared with other and more elegant preparations I do not know. It is especially effective in those cases where the patient states that the habits have been regular.

While it may be that the pain in all cases can only be explained by a complicated reflex mechanism, it seems to be a good rule of thumb in the majority of cases to regard it as being due to the mechanical drag of a loaded bowel. There is one other point: it is necessary to reassure the patient in regard to her heart, but as the lady is likely to have discussed the trouble with her friends, the "rheumatism round the heart" diagnosis of the old family doctor is not without its good points; it sounds much nicer, and is more flattering than "constipation," and is just as safe. I am, Sir, yours faithfully,

Halifax, June 17th, 1930. A. GARVIE.

GAS-OXYGEN AS A ROUTINE ANÆSTHETIC.

To the Editor of THE LANCET.

SIR,—I am much interested in Dr. A. H. Macklin's report in your issue of June 7th (p. 1231) on the routine use of gas and oxygen for major operative work. There is no doubt that he has realised the importance of using an efficient machine. I see that he is attempting to devise a facepiece which will deal satisfactorily with edentulous cases. There is no need for him to trouble to do that, as if he will get a McCardie or London pattern airway and use it to keep the nose from coming into contact with the chin, and then cut a piece of Gamgee tissue of suitable size with a hole for the nose and mouth, thoroughly wet it with water, and then use the facepiece he has, inflated so as to be very soft, there is very little difficulty in maintaining an airtight contact. McKesson himself leaves the dentures (if full upper and lower) in, and I have seen for myself, over in the States, that this method answers very well. Of course, in this country it would not be allowed us; the ward sisters and theatre staff would be worried to death if they caught a patient in the theatre with loose teeth. I agree with Dr. Macklin's opinion of the Boyle apparatus,

about which I have already expressed my opinion.[1] There is no doubt that when the public realise the advantages, to themselves, of gas anæsthesia the present opposition to it will speedily break down.

I am, Sir, yours faithfully,

E. J. CHAMBERS,
Anæsthetist to Rotherham Hospital.

June 13th, 1930.

CÆSAREAN SECTION UNDER SPINAL ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—The communication in your issue of May 10th on Cæsarean section under spinal anæsthesia prompts me to the following comment. A patient suffering from congestive heart failure is clearly unfitted to withstand inhalation anæsthesia, but in my experience rachianæsthesia has not been without its ill-effects on the circulation. Under these circumstances local anæsthesia seems to me the method of choice, and by local infiltration with 1 per cent. novocain together with block of the lower intercostal nerves I have been able to carry out the operation with ease. The uterus is, of course, quite insensitive to cutting and handling.—I am, Sir, yours faithfully,

L. F. O'SHAUGHNESSY, F.R.C.S. Eng.,
Sudan Medical Service.

Omdurman, May 27th, 1930.

Obituary.

ROBERT McKENZIE JOHNSTON, M.D., F.R.C.S. EDIN.,

CONSULTING SURGEON TO THE EAR AND THROAT DEPARTMENT, EDINBURGH ROYAL INFIRMARY.

WE regret to record the death of Dr. McKenzie Johnston, the well-known Edinburgh surgeon, which occurred on Sunday, June 1st, at a nursing home, in the seventy-fourth year of his age.

Robert McKenzie Johnston was born in Edinburgh in 1856, the son of a surgeon in the H.E.I.C., whose other sons included the distinguished Scottish lawyer, Lord Johnston, and Sir Duncan Johnston, of the Ordnance Survey. Robert was educated at Clifton and the Edinburgh Academy, entered the University for his medical training, and graduated in medicine in 1881, proceeding to the M.D. in 1883, after holding the post of resident physician at the Royal Infirmary. He obtained the F.R.C.S. Edin. in the following year, and went into general practice. But in 1890, having in the meantime taken special interest in diseases of the ear, nose, and throat, he was appointed assistant surgeon to the Royal Infirmary, where a special department of laryngology had been formed under the late Prof. Peter McBride. The department was then quite a small one, but it gradually developed, more accommodation was found for patients, with a complete out-patient department and lecture theatre, and by 1903, when McKenzie Johnston became full surgeon, the annex to the infirmary was completely up to date. It has since regularly received all necessary complements to its utility, for McKenzie Johnston was extremely well informed on the technical side of his specialty. When ill-health led to his cessation of work in 1906, he was established by practical performance as a professional leader. He did not, however, allow the break in his career to become a tragedy, and although he resigned his hospital and university appointments, he shortly afterwards returned to work, when other organisations and institutions benefited from his freer energies. He had joined the board of management of the Infirmary in 1907, and for 12 years he was manager of the institution, where his services proved of the utmost value. He was also an indefatigable member of the University Court. At the Royal College of Surgeons he acted for a time as secretary, and when in 1917 he was elected President it was felt that he had obtained the eminent professional position as a reward alike of industry, capacity, and learning.

We owe to Sir Leslie Mackenzie the following appreciation of Dr. McKenzie Johnston's character:—

"At once a man of culture and of serious views on all serious questions, he was tenacious of his opinions, yet gracious in argument. He was fearless and ready in action, yet not insistent or aggressive. He was, from the standpoint of many younger medical 'reformers,' very conservative. But then he showed in his whole dealings the deeply rooted sense of honour that made him a force in the profession and in all the public bodies on which he served—the Royal Infirmary, Fettes College, the University Court, and others. It was in the nature of things that such a man should come into the Presidentship of the College of Surgeons. He carried into all his life a reverence for the past, but his mind was always subtle and alert and, if he did need to be persuaded of the value of new changes, he 'played the game' when his persuasion was complete. He took all his work with grave seriousness, and that was, no doubt, the main secret of his great influence. His quiet, undemonstrative manner gave no immediate indication of his personal force but, once known, McKenzie Johnston was seen to be a man of intense grip and invincible will. He leaves a gap in the life of Edinburgh, perhaps we should say in the life of the 'older Edinburgh,' when the conditions were still simple enough to enable a cultured doctor to take his share in civil administration as well as in his professional specialty. Edinburgh is fortunate in having had many such men; but Johnston was one of the best."

In addition to the work done for the Infirmary, the College of Surgeons, and the University, McKenzie Johnston gave much time and thought to the affairs of the British Medical Association, being for two periods on the Council and an assiduous member of the Building Sub-Committee which over 20 years ago took over the rebuilding of the Strand premises of the Association. He was also a governor of Fettes College, and a member of the Royal Company of Archers.

Dr. Johnston married a daughter of the late Mr. Henry Younger, of Benmore, Argyllshire, by whom he was predeceased, while he is survived by three sons and a daughter.

ANGHEL GASTER, M.D. BUCHAREST, M.R.C.P. LOND.

Dr. Anghel Gaster, whose death at the age of 66 was announced in a recent issue of THE LANCET, died at his residence, 33, Devonshire-place, W., on May 31st.

Anghel Gaster was born at Bucharest and received his general and medical education in his native city. His father was a man of importance in Bucharest, and one of his brothers, who entered the Jewish priesthood, was well known as an ethnologist and a learned student of divinity. Anghel Gaster, after obtaining his medical degree at Bucharest University, became resident at one of the chief hospitals in the city, where he began to study closely diseases of the chest and the therapeutics of tuberculosis. In the year in which he graduated in medicine, the Rev. Dr. Moses Gaster, the theologian brother, came to England to take up a high appointment in the Jewish Church, and Anghel Gaster, after post-graduate study in Paris and Berlin, joined him in London. He obtained the diploma of M.R.C.P. Lond. in 1891, held a resident appointment in the City of London Chest Hospital, and then went into general practice in a characteristic manner—that is to say, he worked in Hampstead and in the East End of London simultaneously, devoting a large proportion of his time to gratuitous labour among the poor in Stepney and the adjoining districts. He was equally successful

[1] Brit. Med. Jour., 1929, i., 1099.

in both classes of practice, his sterling qualities of character being backed by high professional skill. In 1896, having become a naturalised British subject, he married Miss Leah Mocatta, and shortly afterwards his position both as doctor and philanthropist was consolidated by the leading part which he played in the foundation of the London Jewish Hospital in Stepney. Of this hospital he was treasurer from the outset in association with his wife, and in the 20 years of the life of the institution it has developed from 10 to over 100 beds.

Throughout the war he was commanding officer of the Tudor House Military Hospital in Hampstead, while he also held appointments in Kensington, at the Kensington and Fulham General Hospital, and in Hampstead as medical officer to the Baroness de Hirsch Convalescent Home.

One of his colleagues on the staff of the London Jewish Hospital sends us a warm appreciation of Gaster's work there. "As a physician," he writes, "he had charge of both in-patients and out-patients, and the latter flocked to him in great number, while he never spared himself. His fluency in many languages was here of great value; it may be said truly that he was loved by his patients, and he is deeply regretted by his colleagues and many friends."

THE LATE DR. COOPER PATTIN.

Dr. Soothill, the medical officer of health for Norwich, has sent us the following tribute to the qualities of his predecessor. Of Dr. Cooper Pattin he says: "He was a leader of thought in many ways, the cubicle block at the Norwich Isolation Hospital being one of the first in the country, and the inclusion of school-children of 10 years and 13 years of age in the routine groups for school medical inspection being an unusual advance. In fact, starting from the small beginnings usual in those times, he left a public health department which could compare favourably with any authority of similar size in the country, while the results, as shown by the diminishing death-rates published in his last annual report, testify to the quality of the work done. As the figures are of general public health interest, it is as well to mention them here. Dr. Pattin said: 'It is of interest to myself to state that in my first year of service and in my last..... the corrected death-rates (were) 18·1 and 10·4 per 1000. The infantile mortality-rates, 196·25 and 58·1 per 1000 births. The death-rates from tuberculous diseases, 2·4 and 1·1 per 1000. The notifications of enteric (typhoid) fever, 314—with 36 deaths and 14 with 2 deaths—of puerperal fever, 15 with 10 deaths and 9 with 3 deaths.'

"Dr. Pattin was a fluent and witty speaker with a great fund of humour, but was not at all shy of making the same jest repeatedly in public—and it always 'went down.' He labelled himself an improvident philosopher, stated that he had lived more for the life he had enjoyed than the livelihood, and was indeed generous beyond his means, while his will is concerned with a scholarship for medical education. All the arts and sciences were discussed with gusto, and in many cases with close knowledge, while he thoroughly enjoyed a game of bridge or bowls. He never appeared flurried; he was shrewd, able, upright, and advanced a long way in Norwich along the path of the education of the 'vested interests' to the point of view that improved conditions are to their own advantage."

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—A general meeting of this society was held at the London Jewish Hospital on June 12th, the President, Dr. J. Burford, in the chair. The following officers were elected for the ensuing year: President, Dr. L. Mandel; vice-president, Mr. M. Sourasky; treasurer, Dr. L. Turiansky; hon. clinical secretary, Dr. H. Avery; hon. general secretary, Dr. L. Phillips; committee, Dr. Appel, Dr. Dywien, Dr. Kaplin, Dr. D. Krestin, Dr. Robinowitz, Dr. Rosenzvit, and Mr. A. Sorsby.

Medical News.

UNIVERSITY OF OXFORD.—Patrick Corbett Mallam, B.M., has been elected to a Schorstein research fellowship.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—An ordinary meeting of the Council was held on June 12th, with Lord Moynihan, the President, in the chair.

Diplomas of Fellowship were granted to the following candidates who were successful at the recent examination:—

Charles Edward Kindersley, St. Bart.'s; Arnold Guy Harsant, London; Philippa Parry Martin, Univ. Coll.; Henry Richard Rishworth, St. Mary's and London; Louis Amos Bennett, Otago and St. Bart.'s; Arthur Elliot Smith, Univ. College; Terence Edward Cawthorne, King's College; Thomas Smith Donovan, Birmingham; Arthur Edgar De Chazal, Univ. College; Frederick James Theodore Foenander, Ceylon and Middlesex; John Giddings Milner, St. Bart.'s; John Geoffrey Yates Bell, King's College; Arthur Charles Copley and James Rudd Ratcliffe, Guy's; James Cosbie Ross, Liverpool and Guy's; Thomas Holmes Sellors, Oxford and Middlesex; Gavin Hamilton Livingstone and Hubert Lyon-Campbell Wood, King's College; Hugh Osmund Blauvelt, Dalhousie and London; Arthur Capel Herbert Bell, St. Bart.'s; Robert Rutherford, King's College; Mahmoud Ismail Ashmawi, Cairo and St. Bart.'s; Archie Murrell Acheson Moore and John Foster, London; Arthur Espie Porritt, Otago and St. Mary's; Kenneth Harold Watkins, Manchester and Guy's; Henry Hamilton Stewart, St. Thomas's; David William Currie, Leeds and St. Bart.'s; Vencatachari Srinivasan, St. Bart.'s; Hermon Taylor, Camb. and St. Bart.'s; Thomas Giblin, Melbourne and Guy's; John Gordon Sandrey, Sydney and St. Bart.'s; Robert Henry Hadley, Melbourne and London; Shantilal Jamnadas Mehta, St. Bart.'s; Sangham Lal, London; William Donald Bedford, Leeds and London; Myles Landseer Formby, Adelaide and Guy's; Robert Grainger, Belfast and St. Bart.'s; Victor John Kinsella, Sydney and Guy's; Eric Ian Alan Macdonald, Otago and St. Bart.'s; John Mark, Otago and Guy's; Robert John Cecil Maxwell, Belfast and St. Bart.'s; and Hector Hamilton Stewart, Melbourne and St. Bart.'s.

Diplomas of Membership were granted to: Mabel Eileen Grace, Joyce MacInnes, Ruth Milne, and Helen Elizabeth Rodway (Royal Free), who had previously passed the final examinations in medicine, surgery, and midwifery of the Examining Board in England and had now complied with the regulations.

At the primary examination for the Fellowship, held from June 3rd to 14th, for which 158 candidates presented themselves, 54 were approved. The following are the names and schools of the successful candidates:—

S. Ahmad, M.B., Punjab and London; G. L. Alexander, M.B., Edinburgh; D. R. Bharucha, M.B., Bombay, King's Col., and Middlesex; R. W. Billington, Cambridge and Middlesex; V. G. Borgaonkar, M.B., Bombay and London; G. H. Brandis, M.B., Melbourne and King's Coll.; M. Coleman, M.B., Univ. Coll.; T. G. B. Crawford, M.B., Trin. Coll., Dublin; A. W. Cubitt, B.M., Oxford and King's Coll.; M. P. Ellis, M.R.C.S., Univ. Coll.; B. E. Fernando, L.M.S., Ceylon, Middlesex, and King's Coll.; D. I. Fitzpatrick, M.B., Melbourne and King's Coll.; G. H. V. Froggatt, M.R.C.S., Sheffield and Middlesex; E. Galinsky, Univ. Coll.; P. H. R. Ghey, Cambridge; B. Gilbert, St. Thomas's; A. El S. Handousa, M.R.C.S., Cairo and St. Mary's; J. B. Harman, Cambridge and St. Thomas's; B. P. Harris, Cambridge and Middlesex; G. J. Hollis, M.R.C.S., Guy's; J. F. Jarvis, King's Coll.; A. N. Jones, M.B., Liverpool and Middlesex; K. D. Keele, St. Bart.'s; T. King, M.B., Melbourne and King's Coll.; R. Lal, M.B., Lucknow and Middlesex; J. M. Leggate, M.B., Liverpool; A. H. London, M.B., Adelaide; F. R. Leonard, M.B., Otago and King's Coll.; H. G. Letcher, M.B., Adelaide, King's Coll., and Middlesex; A. L. Light, M.B., Leeds and Middlesex; S. N. Lytle, M.B., Belfast; E. G. MacMahon, M.B., Sydney, Middlesex, and St. Mary's; K. M. Masani, M.B., Bombay and Middlesex; Mary H. Mayeur, Lond. Sch. Medicine; D. M. Mitchell, M.B., Otago; N. St. C. Mulhearn, M.B., Sydney and Middlesex; E. G. Murphy, Univ. Coll.; J. H. North, M.B., Otago and King's Coll.; J. O'Donnell, M.B., Leeds; J. Penry, M.R.C.S., St. Mary's and King's Coll.; G. Qvist, Univ. Coll.; K. C. T. Rawle, M.B., Sydney, King's Coll., and St. Mary's; R. V. Rickard, M.B., Sydney, King's Coll., and St. Mary's; L. N. Ross, M.B., Belfast; J. E. Semple, M.B., St. Thomas's; E. J. Smith, King's Coll.; B. R. Sworn, M.B., St. Thomas's; G. R. A. Syme, M.B., Melbourne, St. Mary's and King's Coll.; G. G. Talbot, M.B., Otago and King's Coll.; W. H. Tandy, M.R.C.S., Birmingham and Middlesex; Lilian E. Tracey, Lond Sch. Medicine; E. N. Wardle, M.B., Liverpool; J. C. F. L. Williamson, M.B., Cambridge and St. Bart.'s; I. Zieve, Cape, St. Mary's, and King's Coll.

Mr. Max Page, surgeon to St. Thomas's Hospital, was elected a member of the court of examiners for five years in the vacancy occasioned by the retirement of Mr. Graham Simpson, of Sheffield. The following examiners were elected for the ensuing year:—

Dental Surgery.—(Surgical Section)—L. Bathe Rawling, H. S. Clogg, T. P. Legg, Russell J. Howard, Gwynne

Williams, John Murray, C. E. Shattock, and Cecil P. G. Wakeley.

Examiners for the Fellowship.—(Anatomy)—P. N. B. Odgers, William Wright, J. Ernest Frazer, and J. Basil Hume; (Physiology)—H. E. Roaf, C. A. Lovatt Evans, R. J. S. McDowall, and John Mellanby.

Conjoint Examining Board.—(Elementary Biology)—James P. Hill and T. J. Evans; (Anatomy)—R. Bramble Green, W. E. Le Gros Clark, and H. A. Harris; (Physiology)—E. B. Verney and Hamilton Hartridge; (Midwifery)—Clifford White, T. B. Davies, A. W. Bourne, and Sidney Forsdike.

Diploma in Public Health.—(Part I.)—John Eyre; (Part II.)—C. W. Hutt.

Diploma in Tropical Medicine and Hygiene.—(Pathology and Tropical Medicine)—David Harvey.

Tropical Medicine and Surgery.—G. Carmichael Low.

Diploma in Ophthalmic Medicine and Surgery.—(Part I.)—H. Willoughby Lyle and W. S. Duke-Elder; (Part II.)—R. Affleck Greeves.

Diploma in Psychological Medicine.—J. G. Greenfield.

Diploma in Laryngology and Otology.—(Part I.)—W. M. Mollison and Norman Patterson; (Part II.)—W. G. Howarth.

Diploma in Gynæcology and Obstetrics.—J. D. Barris.

Dr. Harold Dew was elected a Hunterian Professor for the ensuing year, and will deliver a lecture on Hydatid Disease—some Interesting Complications, on Thursday, July 10th, at 2.45 P.M.

It was decided to proceed with the arrangements for holding the primary examination in anatomy and physiology for the Fellowship in Canada, at Montreal, and Prof. William Wright and Prof. Lovatt Evans were appointed to conduct the examination.

Sir Holburt Waring was appointed to represent the College at the ceremonies of the inauguration of the buildings of the University of Brussels and of the School of Medicine from June 23rd to 25th.

UNIVERSITY OF BRISTOL.—At recent examinations the following candidates were successful:—

CH.M.

Robert Victor Cooke.

FINAL EXAMINATION FOR M.B., CH.B.

Part I.—K. P. Beaubrun, L. C. Holland, and (completing examination) A. J. B. Miall.

Part II.—With Second Class Honours: *J. F. Coates and †G. F. Langley. *Pass*: H. F. G. Corfield, R. D. Jones, R. A. Lattey, R. P. Lucas, H. M. Strover, and (completing examination) R. M. Norman.

* Distinction in Medicine and Obstetrics.
† Distinction in Medicine and Public Health.

FINAL EXAMINATION FOR B.D.S.

Pass.—Muriel E. S. Cosh and William Forsyth.

FINAL EXAMINATION FOR L.D.S.

A. N. Moon, T. A. Satchwell, C. G. Westlake, and Idwal W. Williams.

D.P.H.

Part II.—W. W. S. Sharpe.

UNIVERSITY OF LONDON: *University College.*—Mr. R. K. Cannan has resigned his lectureship in biochemistry on appointment to the chair of chemistry in New York University, and Mr. G. F. Marrian has been appointed lecturer in his place.

UNIVERSITY OF DURHAM.—The honorary degree of D.C.L. is to be conferred on Lieut.-General H. B. Fawcus, Director-General of the Army Medical Services.

EPSOM COLLEGE: *St. Anne's Scholarship.*—The Council of Epsom College will shortly elect a girl to a St. Anne's scholarship of £120 a year. Candidates must be at least 9 and not more than 12 years old on July 30th, and must be orphan daughters of medical men who have been for not less than five years in independent practice in England or Wales. Application must be made by July 3rd on a form to be obtained from the secretary of the College, at 49, Bedford-square, W.C. 1.

PHYSIOLOGICAL SOCIETY.—This society is holding a meeting at 2.30 P.M. on Saturday, June 21st, at University College, London, with Sir Charles Sherrington, O.M., in the chair. At 3.30 Dr. Georges Bourguignon will demonstrate the technique of chronaxie measurements on human subjects and Dr. Léon Brillouin will explain his new apparatus for making such measurements. These demonstrations will be preceded (at 2.30 P.M.) and followed (from 5.15 to 6.15) by a discussion on Chronaxie and Central Nervous Activity. The speakers will be Prof. Louis Lapicque, Dr. Henri Laugier, Dr. Catherine Veil, and Prof. Henri Fredericq, and members of the medical profession are invited to attend. In the evening a dinner in honour of Sir Edward Sharpey-Schafer will be held at the Trocadero Restaurant.

SOCIETY OF APOTHECARIES OF LONDON.—Mr. Reginald Silby Lewis, LL.B., has been appointed medical registrar to this society.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At a recent meeting of the Faculty the following were elected to honorary Fellowships: Dr. Robert Muir, professor of bacteriology in the University of Glasgow; Dr. William Loudon Reid, formerly president of the Faculty; and Lieut.-Colonel Laurence Austine Waddell, I.M.S. (retd.).

ROYAL SUPPORT FOR HOSPITALS.—On Thursday last week the Prince of Wales visited Edinburgh in connexion with the bi-centenary of the Royal Infirmary. He first formally opened the Murray Home for wounded and invalided soldiers and sailors, and planted a commemorative tree. The home, which accommodates 20 residents, and contains a surgery and a sick room, has been provided at a cost of £22,000 under the will of the late Miss Helen Murray. The Prince then went to the Royal Infirmary, where he visited the wards, planted another commemorative tree, and after lunching with the City Council, made a speech supporting the appeal for £500,000 for an extension of the hospital.—On the same day Princess Mary opened an enlargement of the East Surrey Hospital at Redhill, and the Duke of York presided over a festival dinner at the Mansion House in support of the fund of £100,000 which is being raised for extensions to the Royal National Orthopædic Hospital, and for the provision of better equipment and the creation of a maintenance fund. There are 1000 child patients on the waiting-list.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—The forty-eighth annual dinner of this society was held at the Trocadero Restaurant, London, on June 12th, and was well attended. The chair was taken by Dr. J. F. Halls-Dally, who gave an interesting historical account of the origin of the society, whose first two dinners were held at the Star and Garter Hotel, Richmond. Their membership he said, now numbered 360 and 32 new members had been added during the year. Lord Moynihan congratulated the society on having held aloof from amalgamation in the Royal Society of Medicine, an advantage, he suggested, shared by both parties. Medical London, he remarked, had been behind the provinces in the acceptance of Listerism and generally in progress and enlightenment. With undergraduates it had been successful; the schools had taught them all the medicine and more than all the surgery that they knew, and had inspired them with the right principles of conduct; but although the isolation of its several schools happily had now broken down London had not yet realised its opportunities for post-graduate medical teaching. He desired to see a great research centre at the Royal College of Surgeons with its home at Down in Charles Darwin's old house, and he looked to the foundation of an Academy of Medicine. Dr. A. Knyvett Gordon, proposing "Kindred Societies and Guests," offered the Agent-General for Queensland, who was chief guest, medical exports in the form of his neurasthenic patients to populate the broad spaces of the State, accepting in return the radium which he believed might be mined there. Sir Edward Macartney, in replying, admitted the mineral wealth of Queensland, but disclaimed a knowledge of the existence of radium, although he would willingly assist Dr. Gordon and his friends with a concession for obtaining it. Dr. P. Montague Smith, President of the Harveian Society of London, and Major Hugh Wakefield also replied, the latter with inimitable stories in Lancashire and Cockney vernacular. Sir Dennis Herbert proposed "The Chairman" in happy terms. Mr. Finlay Dunn, at the piano, entertained the company.

MATERNITY AND CHILD WELFARE.—A national conference on this subject will be held at Friends House, Euston-road, London, N.W., from July 1st to 3rd. At the opening meeting Dame Louise McIlroy will take the chair, Miss Susan Lawrence, M.P., Parliamentary Secretary to the Ministry of Health, will give a presidential address, and a debate on Infant and Pre-school Child Mortality will be opened by Dr. T. H. C. Stevenson, of the General Register Office. On the second day Mr. Neville Chamberlain, M.P., will take the chair, and the subject before the meeting will be the Relationship between Housing and Child Welfare, introduced by Sir John Robertson. In the afternoon Sir Robert Jones will preside at a session at which the two subjects of discussion will be the Relationship between the Orthopædic Clinics and Child Welfare Centres, opened by Dr. T. Hartley Martin, and the After-care of Non-notifiable Infectious Diseases, opened by Dr. K. H. Tallerman. On the evening of the same day Prof. S. J. Cowell will lecture on Present Research in Nutrition. On July 3rd the chairman will be Lady Lawrence, and the first debate, on the Care of the Pre-school Child, will be opened by Dr. G. C. M.

M'Gonigle, Dr. J. Middleton Martin, and Dr. H. W. Pooler. Among those contributing in the afternoon, when Sir Arthur Stanley will preside, will be Sir F. Truby King, who will speak on Progressive Developments in the Feeding and Care of Infants. At 5 P.M. Dr. J. A. Stephen will give his presidential address to the maternity and child welfare group of the Society of Medical Officers of Health. During and after the conference visits will be paid to child welfare centres of various kinds. Particulars may be had from Miss J. Halford, 117, Piccadilly, W. 1.—A post-graduate course in this subject will be held at various centres in London from Monday, June 30th, to Saturday, July 5th. It is being arranged in connexion with the annual meeting of the M. and C.W. group of the Society of Medical Officers of Health, but there will be a few vacancies for practitioners not in the public health service. Particulars may be had from the Fellowship of Medicine at 1, Wimpole-street, W. 1.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

THURSDAY, June 26th.—8.30 P.M., UROLOGY. Paper, Mr. Swift Joly: Cystoscopic Diathermy for Villous Growths of the Bladder.

FRIDAY and SATURDAY.—OTOLOGY: Summer Meeting at Nottingham. Papers have been promised by Dr. Muir Evans, Prof. Guido Guida, Dr. Densham, and Mr. Lowndes Yates. Cases and demonstrations by Mr. Alexander Tweedie, Mr. Bell Tawse, Mr. Sydney Scott, and Mr. George Wilkinson. Exhibition of mechanical and electrical aids to hearing. Discussion on the proceedings of the Committee for the Consideration of Hearing Tests.

LONDON CLINICAL SOCIETY.

TUESDAY, June 24th.—9 P.M. (at the London Temperance Hospital), Sir Robert Armstrong-Jones: The Evolution of the Human Mind. (Illustrated by lantern slides.) (Fifth annual Macalister Lecture.)

MEDICO-LEGAL SOCIETY,

THURSDAY, June 26th.—8.30 P.M. (at 11, Chandos-street, W.), Annual General Meeting. Prof. J. S. Haldane: Carbon Monoxide Poisoning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, June 23rd, to SATURDAY, June 28th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W., Special M.R.C.P. Lectures at 8.30 P.M. Tues. and Fri., Dr. W. J. Adie, Diseases of the Nervous System; NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.: Mon., 2.15 P.M., Dr. Strickland Goodall, Demonstration in O.P. Department. No fee.—ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, W.: Thurs., 1.30 P.M., Mr. R. Y. Paton, Demonstration in O.P. Department. No fee.—BLACKFRIARS SKIN HOSPITAL, Blackfriars-road, S.E.: Afternoon Course, second week, Special Demonstration on Tuesday.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W.: Second week of Course in Gynæcology, mornings and/or afternoons.—HOSPITAL FOR TROPICAL DISEASES, Gordon-street, W.C.: Second week of course, instruction from 11–12.30, 2–3.30 P.M.—PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N. Intensive Course in Medicine and Surgery. Further particulars from the Fellowship of Medicine.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, June 23rd.—12 noon, Dr. Greenfield: Cerebro-spinal Fluid. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Kinnier Wilson: Varieties of Peripheral Neuritis.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Grainger Stewart: Spinal Tumours and Compression Paraplegia.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Gordon Holmes: Lesions of the Cerebellum.

FRIDAY.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of the Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Walshe: Disorders of the Motor System.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.

WEDNESDAY, June 25th.—4.15 P.M. (at St. John's Hospital, 49, Leicester-square, W.C.), Annual General Meeting and Cases.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, June 23rd.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M., Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat, and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M., Medical, Surgical, and Children's Diseases Clinics. Operations.

Appointments.

GUY, J., M.B., C.M. Glasg., D.P.H., has been appointed Medical Officer of Health for Edinburgh.

TATTERSALL, S. R., L.R.C.P. Lond., M.R.C.S., Deputy Superintendent of Prestwich Mental Hospital.

Vacancies.

For further information refer to the advertisement columns.

Barnsley, Beckett Hospital and Dispensary.—H.P. £200.
Bath, Royal United Hospital. H.P. £120.
Bethnal Green Hospital, Cambridge-road, E.—Asst. M.O. £400.
Birkenhead County Borough.—Asst. M.O.H. and Bacteriologist. £750.
Birmingham, City of.—1st Asst. M.O. £600.
Birmingham General Hospital.—Res. H.S. to Throat and Ear Dept. £70. Also Anæsthetist. £120.
Birmingham, Midland Hospital, Easy-row.—H.S. £150.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.P. At rate of £120.
Bristol Eye Hospital.—Temp. Asst. Hon. Surgeon. Also Registrar.
Bristol General Hospital.—H.P.'s, H.S.'s, Res. Obstet. O., also Cas. H.S. At rate of £60 and £80 respectively.
Bristol Royal Infirmary.—Hon. Reg. to Ear, Nose and Throat Dept. Also Hon. Asst. Radiologist.
Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Sen. and Jun. H.S. £120 and £100 respectively. Out-Patient O. £200.
Chesterfield and North Derbyshire Royal Hospital.—Cas. O. At rate of £200. Also H.S.'s. At rate of £100 to £175.
Colchester, Royal Eastern Counties' Institution for Mentally Defective.—Clin. Research Worker. £600.
Colindale Hospital, Hendon, N.W.—Sen. Asst. M.O. £650.
Countess of Dufferin's Fund, Women's Medical Service for India.—Two Medical Women. 550 and 750 rupees per mensem.
Coventry and Warwickshire Hospital.—Res. Asst. H.S. £125.
Derby, Derbyshire Royal Infirmary.—Asst. H.S. and Cas. O. £150.
Dudley, Guest Hospital.—Hon. Gynæcologist and 2 Anæsthetists. Also Asst. H.S. £150.
Dumfries and Galloway Joint Sanatorium.—Res. Med. Supt. £700.
East London Hospital for Children, Shadwell, E.—Dermatologist.
Edinburgh Royal Infirmary.—Med. Reg. for Statistical Research. £250.
Egyptian University Faculty of Medicine.—Prof. of Hygiene. £E.1500.
Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.
Gloucester, Gloucestershire Royal Infirmary.—2nd H.S. At rate of £100.
Guy's Hospital Medical School, S.E.—Gull Studentship. £250.
Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.—Cas. Surg. O. At rate of £100.
Hospital for Sick Children, Great Ormond-street, W.C.—Part-time Jun. Cas. O. At rate of £150.
Hull Royal Infirmary.—H.S. At rate of £150. 3rd H.S. At rate of £150.
Huntingdon County Hospital.—H.S. £125.
Ilford Borough.—Asst. M.O.H. £600.
Indian Medical Service.—Commissions.
Ipswich, East Suffolk and Ipswich Hospital.—H.P. £120.
Lambeth Hospital, Brook-street, Renfrew-road, S.E.—Jun. Asst. M.O. £200.
Leamington Spa, Warneford General Hospital.—Res. H.S. £165.
Leicester Royal Infirmary.—H.S. At rate of £125.
Lewisham Hospital, Lewisham, S.E.—Asst. M.O. £300.
Lincoln County Hospital.—Jun. H.S.
Liverpool, Mill-road Infirmary.—Res. Asst. M.O. £200.
Liverpool, Royal Children's Hospital, Myrtle-street,—Res. H.S. At rate of £60.
Liverpool, Royal Southern Hospital.—H.P., H.S. Also M.O. to Spec. Depts. Each at rate of £60.
L.C.C. Mental Hospital Service.—8th Asst. M.O. £445.
London University.—External Examinerships.
Manchester, Baguley Sanatorium.—Asst. M.O. £350.
Manchester, Booth Hall Hospital for Children, Charlestown-road, Blackley.—4th Asst. M.O. At rate of £250.
Manchester, Ear Hospital, Grosvenor-square, All Saints.—Non-Res. H.S. At rate of £150.
Manchester Northern Hospital for Women and Children, Park-place, Cheetham Hill-road.—Sen. H.S. and Jun. H.S. £130 and £100 respectively.
Miller General Hospital, Greenwich-road, S.E.—Cas. O. £150.
Nelson Hospital, Merton, S.W.—Res. M.O. At rate of £100.
Newark General Hospital.—Res. H.S. At rate of £150.
Newcastle-upon-Tyne, Education Committee.—Asst. School M.O. £500.
Newcastle-upon-Tyne General Hospital.—Surg. Director. Also Med. Director. Each £300.
New End Hospital, Hampstead, N.W.—Jun. Asst. M.O. £200.
Northampton General Hospital.—Asst. H.S. At rate of £150.
Oldham Royal Infirmary.—H.S. At rate of £175.
Plymouth, South Devon and East Cornwall Hospital.—H.S. At rate of £100.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Res. M.O. £200.
Reading, Battle Infirmary.—Asst. Res. M.O. £300.
Reading, Royal Berkshire Hospital.—H.P. Cas O. and Res. Anæsthetist. Each at rate of £150.

Rotherham Hospital.—Sen. H.S. £200. Also H.P. £180.
Royal Free Hospital, Gray's Inn-road, W.C.—Res. Cas. O. £150.
Royal London Ophthalmic Hospital, City-road, E.C.—Sen. H.S. At rate of £150.
St. Bartholomew's Hospital, E.C.—Surgeon to Throat Dept. Also Asst. Physician.
St. Helens County Borough.—Asst. M.O.H. £600.
St. Mark's Hospital for Cancer, &c., City-road, E.C.—H.S. At rate of £75.
St. Marylebone Hospital, St. Charles-square, Ladbroke-grove, W.—Second Asst. M.O. £300.
Salford Royal Hospital.—Hon. Asst. S., also H.P. and H.S.'s. Each at rate of £125. Also Anæsthetist, 1 gn. per session.
Sheffield Children's Hospital.—3rd Res. M.O. £100.
Sheffield, Jessop Hospital for Women.—3 Asst. H.S.'s. Each at rate of £100.
Sheffield Royal Hospital.—Res. Anæsthetist. At rate of £80.
Sheffield Royal Infirmary.—H.P., H.S., Ophth. H.S., Asst. Aural and Ophth. H.S. Also Asst. Cas. O. All at rate of £80.
South-Eastern Hospital for Children, Sydenham, S.E.—Two Res. M.O.'s At rate of £100 and £75 respectively.
Southampton Free Eye Hospital.—H.S. £150.
South Shields, Ingham Infirmary.—Sen. and Jun. H.S.'s. £200 and £150 respectively.
Stafford, County Bacteriological Laboratory.—Locum Tenens Bacteriologist. 12 gns. weekly.
Stockport Infirmary.—Visiting Asst. Ophth. Surgeon for Eye Dept.
Sunderland, Durham County and Sunderland Eye Infirmary.—Locum.
Surrey County Council.—Asst. M.O. £600.
Swansea County Borough.—Asst. M.O. £600.
Truro, Royal Cornwall Infirmary.—H.S. £170.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.P. and H.S. Each at rate of £100.
Wallasey, Victoria Central Hospital.—Jun. H.S. At rate of £100.
Walsall General Hospital.—Cas. H.S. At rate of £120.
West African Medical Staff.—M.O.'s. Each £660.
West London Hospital, Hammersmith-road, W.—Two Clin. Assists. Res. Asst. Phys. £300.
Wigan Royal Infirmary.—Res. Med. and Surg. O. and Reg. £250. Also Two H.S.'s. Each at rate of £150.
Willesden General Hospital, N.W.—Res. H.S. £110.
Windsor, King Edward VII. Hospital.—H.S. At rate of £100.
York County Hospital.—Res. Anæsthetist. £150.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Cupar (Fifeshire), and Tonbridge (Kent).

Births, Marriages, and Deaths.

BIRTHS.

EAST.—On June 8th, in London, the wife of C. F. Terence East, M.D., F.R.C.P., of a daughter (stillborn).
HAWKINS.—On June 9th, the wife of B. E. Hawkins, M.R.C.S., of a son.
PEYTON.—On June 13th, at 19, Bentinck-street, W., the wife of Dr. Peyton, Harley-street, of a daughter.
RAMMELL.—On June 13th, at Bricket House, St. Albans, the wife of Dr. John Wootton Rammell, M.C., of a son.
REYNELL.—On June 10th, at 26, Nottingham-place, W., the wife of W. R. Reynell, M.D., of a son.

MARRIAGES.

ANDERSON—SINCLAIR-MACLAGAN.—On June 11th, at St. Mary's Episcopal Church, Kirriemuir, John Anderson, D.S.O., F.R.C.S., to Isobel Sinclair MacLagan, only daughter of Major-Gen. E. G. Sinclair-MacLagan.
BUCKTON—MEZ.—On June 11th, in Basel, Philip Rhoades Buckton, M.A., M.B., of Wymondham, Norfolk, to Annemarie Charlotte, only daughter of the late Professor Mez, of Basel University, and of Mrs. Mez.
DODD—OPENSHAW.—On June 14th, at St. Andrew's Church, Kensington, Harold Dodd, F.R.C.S., of Harley-street, to Kathleen Openshaw, of Madge Hill, Hanwell.
MACAFEE—LOWRY.—On June 4th, at Newtownbreda Presbyterian Church, Charles Horner Greer Macafee, M.B., F.R.C.S. (Eng. and I.), to Margaret Crymble, only daughter of Prof. C. G. Lowry, M.D., F.R.C.S., and Mrs. Lowry.
WATSON JONES—COOK.—On June 11th, at Princes-gate Baptist Church, Liverpool, Reginald Watson Jones, M.Ch., F.R.C.S., to Muriel, only daughter of Mr. and Mrs. C. W. Cook, of Mossley Hill, Liverpool.
WILLIAMS—COURON.—On June 12th, at the Oratory, Brompton, Dr. Leslie Williams, M.D., M.S., F.R.C.S., to Patrice, elder daughter of the late Mr. and Mrs. Hatton Ronayne Couron, of Mayfield, Sussex.

DEATHS.

DODD.—On June 11th, Col. John Richard Dodd, A.M.S., retired, of Killarney, Richmond Park-road, Bournemouth.
MINCHIN.—On June 5th, in London, Edward James, Minchin, L.R.C.S.I., L.R.C.P.I., in his 75th year.
SKIRVING.—On June 14th, at 6, Rothesay-place, Edinburgh, Archibald Adam Scot Skirving, C.M.G., F.R.C.S.E., aged 61.
WHITFORD.—On June 15th, at 26, Sandymount-drive, New Brighton, William Whitford, M.D., J.P., in his 86th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

Notes, Comments, and Abstracts.

STERILISATION OF THE UNFIT.

A Report to the Lancashire Asylums Board

BY FRANK A. GILL, M.D. ABERD.,
MEDICAL SUPERINTENDENT OF THE CALDERSTONES CERTIFIED INSTITUTION FOR MENTAL DEFECTIVES, WHALLEY.

STERILISATION by castration has been known and practised as early as there are historical records. Unrestrained by public opinion which was, no doubt, dealt with by equally drastic means, our ancestors were actuated by a certain clarity of purpose which left no room for scruples or sentiment. For the creation of eunuchs, as a punishment for crime, and as a deterrent for prostitution, it was undoubtedly practised, but there is only legendary evidence that it was ever enforced for the improvement of the human race. Eugenic sterilisation, as it is called, is a modern practice which has met with a large measure of approval in California, and to a less extent in other American States, and elsewhere.

Historical.

Sterilisation for race improvement was first advocated towards the end of the eighteenth century, and again in the latter half of the nineteenth century public interest was aroused and discussions appeared in a few medical journals. The first actual operations, so far as I am aware, were performed without legal sanction in Kansas, U.S.A., towards the end of the last century. Legislation authorising it was first passed in Pennsylvania in 1905 and next in Indiana in 1907. A few other States in U.S.A. followed their example, but the practice fell into disuse from lack of public support, and at a later date it was declared unconstitutional and illegal. It was declared unconstitutional, as the law was made applicable to criminals and held to be a "cruel and unusual" form of punishment and, therefore, contrary to the Constitution.

More recently the sterilisation law in U.S.A. has been amended and declared constitutional, with the result that up to July 1st, 1929, the following 22 States have passed laws sanctioning its practice: Arizona, California, Connecticut, Delaware, Idaho, Iowa, Kansas, Maine, Michigan, Minnesota, Mississippi, Montana, Nebraska, New Hampshire, North Dakota, Oregon, South Dakota, Utah, Virginia, Washington, West Virginia, Wisconsin. In Canada, the Province of Alberta has legalised voluntary sterilisation of certain inmates of institutions, and British Columbia is investigating the question.

The Canton of Vaud, Switzerland, last year passed a law prescribing compulsory sterilisation for certain patients. In Germany discussion has been active, and the law seems to permit sterilisation of the unfit, when done with the consent of the patient, or near relative, or guardian. It has been recommended to the New Zealand Parliament, after consideration by an Official Committee.

The Operation.

The surgical operation in both sexes is eminently satisfactory, the danger to life is practically nil, and very few failures are recorded. In the male vasectomy is performed, a section of the cord is removed, and the cut ends tied. It can be done under a local anæsthetic and does not incapacitate the patient for work for more than one day. In the female the abdomen is opened under a general anæsthetic and a section cut from both Fallopian tubes. It involves 14 days in bed, but the danger to life is negligible. In over 2500 operations in the California State hospitals there have been only three deaths, one from anæsthetic and two from infection. Sterilisation by X ray and radium has been considered, but is of doubtful merit, both these agents being too uncertain in their action and not without risk. No doubt in course of time, as their properties are better known, they may become a valuable means of producing eugenic sterilisation without operation and without risk.

Californian Experience.

While many of the States of U.S.A. have laws permitting at the State's expense the sterilisation of mental defectives and insane patients, the Californian law makes it compulsory before discharge from certain institutions. Up till Jan. 1st, 1929, 6255 operations for sterilisation have been performed in this State, the operations being vasectomy or salpingectomy, no glands or organs are removed, and no adverse effects as a sequence are recorded. Sexual life and

activity in the majority of cases does not appear to be appreciably altered, and there is a very satisfactory absence of subsequent moral deterioration which could be attributed to the operation. Male ex-patients do not seem to regret the operation, while the women express definite satisfaction at the knowledge of their freedom from possible pregnancy.

Although the law itself is compulsory it is not often that it has to be invoked, patients and their relatives consenting to the operation freely prior to release. The willing consent of the patient and friends seems to be a striking feature of the public attitude towards it in this State. Should consent be withheld, the authorities have power to detain the patient in the institution if they think fit. The relatives can then only obtain his release by resort to court, which is sometimes successful under onerous conditions. An interesting feature is that voluntary sterilisation by normal married men and women is also being resorted to for the prevention of child-bearing for medical or social reasons.

Californian law now provides for the sterilisation of male offenders guilty of sexual offences: 1. Two convictions for rape, seduction, or at least three other crimes, if there is evidence that he is a moral or sexual degenerate or pervert. 2. A person who exhibits evidence of moral and sexual depravity. 3. A person guilty of carnal abuse of a female person under 10 years of age. For these crimes sterilisation under certain conditions is authorised. It has not been much used, and no deductions can be drawn as to its advisability; it is an entirely different thing from eugenic sterilisation. The appropriate punishment for these offences would appear to be castration, which would have some physical as well as moral therapeutic value.

General Policy.

The policy of eugenic sterilisation is to prevent the propagation of the unfit, the weak, the degenerate, presumably whether physical or mental. Nature in her own scheme made ample provision to secure the elimination of the unfit by natural laws, but these modern civilisation has effectively nullified without enforcing an efficient substitute. Science has provided a substitute simple, safe, and efficient, but it is its application which presents so many difficulties to-day. For the sake of brevity I must omit all reference to the religious, political, and economic sides of this question.

The first obvious question to decide is to which classes of a community is it applicable? Are the physically unfit and propagators or carriers of hereditary disease to be sterilised as well as their mentally unfit contemporaries; if not, why not? It will simplify my task if I leave others to answer the question and confine my observations to the mentally unfit only.

Claim to Reduce Number of Mentally Unfit.

The primary and chief claim for sterilisation is that it will, in time, materially reduce the numbers of the insane and mental defectives, and so ultimately relieve the community of the burden of their maintenance. The fallacy of this claim of wholesale sterilisation lies in the fact, and it is a fact, that the great majority of certifiable defectives are not the progeny of mentally defective parents, but of apparently normal or subnormal, yet more or less self-supporting citizens. In one Lancashire institution there are over 2500 inmates to-day. Very few of the parents are certifiable defectives, the great majority are decent self-supporting members of the community, whom no sterilisation laws could touch or seek to touch.

The great fundamental fact must be kept in mind that the great majority of insane or mental defective patients are not the off-spring of similarly afflicted parents. Yet 80 per cent. of mental deficiency and a smaller percentage of insanity is hereditary. How then does it arise? The answer is that the majority of victims of mental infirmity come of families who are the subject of some mental instability; whose germ cells are in some way faulty, and who may only be carriers or transmitters of defect without themselves exhibiting any trace. It may be so slight and circumstances so favourable that infirmity is never suspected and the progeny escape. On the other hand, a stronger taint and, or, more unfavourable circumstances may intensify the latent defect and so develop the disease.

To express it another way, if every certifiable mental defective had been sterilised 20 or 30 years ago it would have made little appreciable difference to the number of defectives existing to-day. This does not deny the fact that mental deficiency is inherited, nor that the progeny of mental defectives would themselves almost certainly be subnormal, but it does show that mental deficiency cannot be exterminated by sterilising existing defectives. One would have to sterilise all members of the community who are the victims of a mentally unstable constitution, who are probable carriers of mental defect which they will transmit to their progeny, given the necessary combination of circumstances.

Sterilisation of Selected Cases.

While the arguments against a policy of wholesale sterilisation are undeniably strong, there seems to be an excellent case for sterilisation of selected cases. In Calderstones at the moment there are the following certified women who have given birth to illegitimate children:—

Total number of female patients resident at Calderstones on Jan. 1st, 1930, who were 16 years of age or over at the date of their admission (of child-bearing age)			572
Number who have had illegitimate pregnancies			132
Total pregnancies (of which eight were miscarriages or stillbirths)			253
Total of children born alive			245
Number of patients with 1 pregnancy	63 =	63	pregnancies.
" " " 2 pregnancies	40 =	80	"
" " " 3 "	21 =	63	"
" " " 4 "	2 =	8	"
" " " 5 "	4 =	20	"
" " " 9 "	1 =	9	"
" " " 10 "	1 =	10	"
Total	132 =	253	"
Percentage having illegitimate pregnancies	= 23·8		

Obviously there is something radically wrong with the legislature of a State which permits certifiably defective women to become pregnant nine and ten times, and give birth to a like number of illegitimate and almost certainly defective children. The same applies to the other cases quoted above in a slightly less degree. Amongst female patients released from Calderstones for a short holiday on trial, in situations, four have been brought back pregnant within the last six months. The lesson here would seem to be that female patients of child-bearing age must never be released even on trial, but it is hard on the parents and hardly fair, as well as discouraging to the patients never to give them a holiday home or a trial to make good. The obvious remedy here is sterilisation before leaving an institution, a policy already in force in California. To a less extent the same precautionary measure seems reasonable to apply to adult male patients before release on trial. There are many patients of both sexes whose infirmity is so pronounced that they are only fitted to spend their lives in an institution, where it is probably as economical to keep them as at liberty; but there are undoubtedly many others who might lead at least partially self-supporting and useful lives in suitable employment or in care of their friends but for the danger of propagation of their kind. For these latter the obvious remedy seems to be sterilisation under proper safeguards.

Insanity and Epilepsy.

The hereditary nature of the liability to some forms of insanity is admitted, though that of epilepsy may be more debatable. The case for sterilisation seems specially strong in those types of insanity which exhibit periodical remissions during which the patient is well enough to be discharged to the care of his friends, and, if married, unfortunately, to the care of wife or husband. They return to married life with every prospect of additional children being born to perpetuate the disease. It seems to be particularly desirable that this class of patient should be sterilised, and especially in the case of the wife, since the strain and anxiety of child-bearing is often no mean factor in precipitating a relapse. In mental hospitals it is now the practice to grant parole as freely as possible; it would seem a reasonable procedure to sterilise selected cases before doing so.

Objections to Sterilisation.

The first objection raised is the danger of an increase in sexual promiscuity with its trail of venereal disease. This argument is freely used by opponents of the policy. The answer is that these arguments are pure surmise and contrary to the experience of social workers in California. In that State, to which we are indebted for its bold experiment, a well-devised scheme of subsequent supervision by experienced social workers is an essential part of the policy.

The reports by interested observers who have visited and investigated on the spot is that the danger is groundless, and that there is no increase in sex delinquency as a sequence to sterilisation. They point out with great truth that the mental defective is usually a sex delinquent by nature, with strong desires unrestrained by moral control or fear of consequences, and the fact that after sterilisation he or she is released from consequential results of immorality makes little difference in conduct. This answer seems reasonable, and my own experience indicates that the majority of higher grade female defectives are immoral before they are committed to Calderstones. They are oversexed with little control and no forethought of the consequences. I do not believe that the act of sterilising will make them any more lax in their morals by depriving them of a "fear of consequences" which never existed. The fact remains that the

reports from California indicate no increase of immorality, though they do not claim any improvement as a sequence. It is interesting to note that in the Californian experiment 125 feeble-minded sterilised women were married with the consent of the authorities, and the marriage has been considered successful in two-thirds of the cases. A second argument by opponents of sterilisation is the probability that public opinion may seize on sterilisation as a cheap and economic remedy for dealing with the problem of the unfit and so cease to make adequate provision in the way of institutions and hospitals. If the problem of the unfit is properly understood this seems to me a futile argument.

Conclusions.

My own view is that: (1) Sterilisation of either sex is a safe and efficient operation. (2) A policy of wholesale sterilisation of the mentally unfit is neither necessary nor desirable. (3) Sterilisation of selected cases of both sexes is desirable before release from mental defective institutions. (4) Certifiable women who become pregnant or are immoral should be sterilised forthwith. (5) Sterilisation of the recurrent insane is desirable and justifiable both in the interests of the race and as a therapeutical measure which relieves them of the anxiety of child-bearing and maintaining a family.

THE SUPPLY OF PASTEURISED MILK.

TWENTY years ago the passage of milk from the cow to the consumer was a comparatively calm one. A conscientious dairyman might occasionally take a sample to a vacant corner of his premises, estimate the fat content by the depth of the cream line, the cleanliness by the colour, and the quality by taste, but even so short a time ago as this there was almost no scientific investigation. To-day the passage is stormy. The milk sold by United Dairies, Ltd., is tested chemically and bacteriologically at the rural centre, at the urban distributing centre, and at any time of the day or night and in any part of its journey by a "flying squad." It is collected and transmitted with close attention to cleanliness and temperature, and is distributed in special bottles, which are soaked and washed for 40 minutes, and then rinsed with Czaplewski's fuchsin to make sure that no film of dirt remains.

At the opening of the company's new research laboratories by Sir Andrew Balfour, on June 16th, the guests were shown the whole process of milk collection and distribution at the large central depôt in Willesden. No less than 50,000 gallons, or 1200 tons, are handled here daily, and over 500 samples are examined in 21 laboratories in London every day. From the small lorries which collect it from the farms the milk is transferred to glass-lined tanks, where it is kept at a temperature below 40° F. throughout the rest of its journey. It is pasteurised at the London depôt at a temperature of 145° F., and then bottled. Over 8,000,000 bottles are distributed every week, and the organisation employs a staff of 12,000 men and women.

In the laboratories the milk is tested for contamination and the fat percentage by chemical methods, and for its general bacterial content by the reductase test with methylene blue. A recent introduction is the microscopic lantern, through which milk samples magnified 225,000 times are projected on to a screen and bacteria are thus revealed. In practice it is found that the result of a test depends on the level from which the sample is taken in the churn. As an example may be cited one specimen of milk which revealed 460,000 organisms per cubic centimetre and the presence of *Bacillus coli* in one-hundredth when the sample was taken from the top of the churn with a dipper. When the same milk was properly mixed in the churn, the bacterial count was reduced to 40,000, and no *B. coli* were found. The suggestion is made that chemical tests should be done at the same time as bacteriological, for if a fat percentage of over six, for instance, is discovered, it will be obvious that the sample is not a representative one.

All the United Dairies' milk is pasteurised. Their authorities hold that the tuberculin test for cattle is not sufficiently reliable, either in a negative or a positive sense, and that pasteurisation is the only way to avoid the risk of the tubercle bacillus in the milk. Moreover, partial sterilisation covers also the risk of infection from an unhealthy dairyman. In support of their policy they say that if vitamin C is destroyed, it is very easily added in a teaspoonful of fruit juice, and there is considerable evidence to show that the milk of stall-fed cattle does not contain this vitamin in any case. Pasteurisation, it is stated, causes no radical chemical change, and the small amount of calcium that is rendered non-dialysable is unlikely to make any great difference to the human child, considering that the cow's milk is intended for an animal with much larger and heavier bones.

An interesting piece of research has recently been carried out on thermophilic organisms in milk. These were first discovered as a result of a breakdown in the plant. If the machinery stands still for a time at pasteurisation temperature these organisms multiply and form acid. They are non-pathogenic; some are spore-formers and protein-splitters, others are vegetating, non-sporulating lactobacilli, which produce large quantities of lactic acid. The important practical point about them is that the Ministry of Health tests are all based on a temperature of 98° F., and the difference of a degree or so in the temperature might permit the multiplication of the thermophile group. The result would be a high bacterial count, and a quite false suggestion that the milk was unhygienically collected. The organisms are present in all raw milk, but they are depressed or attenuated by refrigeration. To destroy them the milk should be kept at 33° F. for 44 hours. Hence the lowered temperature in the glass travelling-tanks, and hence also the practice of shutting down and sterilising the pasteurisation plant every five hours.

In declaring the new laboratories open Sir Andrew Balfour said that the United Dairies had helped the rural medical officer by clean milk competitions in young farmers' clubs, and had done a public service by transferring a large part of the milk supply of the metropolis from the open can to the sterile bottle.

ACCEPTABLE ADVERTISING.

THE wealth of faultily addressed and unattractive material which reaches the average practitioner is not merely irritating but absurdly wasteful, since as often as not it is discarded without examination. The Addressing Company, of 8, Stone Buildings, Lincoln's Inn, London, W.C. 2, has made an attempt to remedy the present casual methods of commercial firms, and undertakes to circularise the medical profession as a whole, or specified groups of members in a manner which shall be accurate and acceptable. The chief points for which the company claims credit are absolute propriety of address, with accurate qualifications and postal direction, and the distribution of ethical material only, following the standard set by the medical journals. The service includes, in addition to the British Isles, the greater part of the Empire. A daily corrections service undertakes to supply to those firms who undertake their own addressing information of changes of address, new degrees and qualifications, and changes of name by marriage. The service can obviously perform a useful function in the prevention of waste by the manufacturer and annoyance to the recipient.

BLOOD GROUPS AND THE SCHICK REACTION.

THE relation of the various blood groups to the Schick diphtheria reaction has been studied by Dr. J. E. Sola,[1] who reports the results of observations on 17 families with 45 children. The conclusions at which he arrives are briefly: that blood grouping is transmitted hereditarily on Mendelian lines, and that the Schick reaction may be found indifferently in any group. If both parents give a positive reaction all the children do the same, supposing their blood groups are the same, and this is also true of a negative reaction; but if the group varies, or there is recessivity amongst the children, the correspondence breaks down. Susceptibility to diphtheria as regards parents and children depends on their both belonging to the same blood group, hence, in Sola's opinion, it is probably due to an hereditary constitutional factor and not to transmitted acquired immunity. The results of the Schick reaction on parents and offspring were held to show that susceptibility to diphtheria is transmitted on Mendelian lines. The conclusions are interesting, but Sola admits that the numbers investigated are small, partly because of the difficulty of getting whole families to consent.

A PANEL OF TRANSLATORS.

THOSE who require the services of a translator often have difficulty in finding one who has both a knowledge of the language and also of the special subject concerned, and the difficulty increases where the language is uncommon and the subject highly technical. In order to meet this need the Association of Special Libraries and Information Bureaux (26, Bedford-square, London, W.C.) has prepared a scheme for establishing a panel of translators having both linguistic and technical qualifications, the part taken by the association being to act as a connecting link between the translator and the user. Names of approved qualified persons are now being registered, and those who are interested, in either capacity, are invited to write for particulars to the secretary of the association.

[1] Semana Méd., April 24th.

Hunterian Lecture

ON THE

PAPILLOMA AND ITS MENACE.

Delivered before the Royal College of Surgeons of England on Jan. 31st, 1930,

BY W. SAMPSON HANDLEY, M.S. LOND.,

FELLOW AND COUNCILLOR OF THE COLLEGE; SENIOR SURGEON TO THE MIDDLESEX HOSPITAL.

THOUGH the subject of this lecture has never been entirely divorced from surgery it has been in the main handed over to the special attention of dermatologists. My reasons for choosing it are several. In the first place, I believe that the accepted theories of the pathogenesis of warts are superficial and unsatisfactory, owing to their neglect of certain basic facts in the minute anatomy of the skin and mucous membranes. In the second place, warts are not confined to the skin. Essentially similar neoplasms, described as adenomata or papillary adenomata or papillomata, are found not only upon the mucous membranes but also in the mucous lining of the narrow excretory ducts, even in channels so narrow that the full morphological development of a papilloma is impossible. These internal warts are of much greater frequency and importance than the warts of cutaneous origin. The subject, then, is a wide one, and concerns the pathology of many of the internal organs. Its main interest, however, lies in this: that recent work by many investigators has shown with continually increasing emphasis the closeness of the relationship between papilloma and carcinoma. The papilloma, though it may remain innocent for many years, would appear on the evidence to be a precancerous phenomenon. The connexion may be obscured by the slow *adagio* of the processes which intervene. The first part of my lecture will be occupied in establishing the relationship between papilloma (or adenoma) and malignancy in particular varieties of cancer. In so doing I will give only a brief outline, with special attention to the more recent work.

A REGIONAL SURVEY.

Tongue.—Leukoplakia, which is a state of papillomatous hyperplasia, precedes cancer of the tongue in three cases out of ten. At the margin of a tongue cancer papillary hypertrophy can generally be recognised.

Larynx.—It is the rule for laryngeal cancer to begin as a papilloma, as in the classical case of the Emperor Frederick.

Stomach.—An association between polypi of the stomach and carcinoma has long been suspected. Cruveilhier (1835–42), quoted by M. J. Stewart, figured an example of multiple gastric polypi in his atlas, and thought that cancers of the pylorus not infrequently originated in such polypi. P. Menetrier and Clunet emphasised this view. H. Brunn and F. Pearl (1926) collected 84 cases of diffuse polyposis of the stomach, of which ten (12 per cent.) were malignant. G. A. Mills (1922–23) found malignancy in four out of twenty cases of diffuse gastric polyposis. Prof. Stewart, of Leeds, from whose paper [1] I have abstracted the early history of the subject, has recently placed the precancerous quality of gastric polypi beyond cavil or question. Among 11,000 necropsies performed at the Leeds Infirmary between 1910 and 1928 he found 47 cases in which gastric polypi were present; single in 27 cases, numerous in 10 cases, and few in number in 10 cases. In six of the cases where a single polyp was present, and in seven of the cases of multiple polypi, a carcinoma was also present. In three cases it could be said with certainty that the carcinoma had originated in a polyp, and in no case could such an origin be excluded. Thus in 28 per cent. of cases of polypus of the stomach a carcinoma is also present. Prof. Stewart says the association of these conditions in the stomach is much less intimate than in the large intestine, but it appears to me not less decisive and unmistakable.

As Prof. Stewart insists, these ostensibly harmless growths have a sinister significance. Do most gastric cancers originate in adenomata? In the 11,000 cases reviewed by Prof Stewart there were 263 cases of cancer of the stomach, but only 47 of gastric polypi. This fact might appear to relegate polypus to a minor rôle in the production of cancer, as compared with chronic ulcer. But it must be remembered that in the bowel, and possibly also in the stomach, carcinoma tends as it grows to destroy the evidence of its origin. The margin of a chronic ulcer of the stomach, as of the leg, is exactly the site in which a local septic lymphangitis must frequently produce papillomatous hypertrophy. It must also be remembered that in the bowel, at any rate, as J. P. Lockhart-Mummery and C. E. Dukes have shown, the evolution of a carcinoma is accompanied by the disappearance of papillomata in adjoining parts of the mucosa. In the breast, as I shall show, a papilloma only just visible to the naked eye may have already become a carcinoma. Until a practical gastroscope is evolved it is unlikely that such evidence will be obtainable in stomach cancer. But the assumption that all gastric cancers originate in adenomata contradicts no fact at present known. Hauser,[2] in 29 cases of stomach cancer, found one which was associated with polypoid overgrowth and five which had arisen from chronic ulcer. Polypoid overgrowths were thus found in only 3·5 per cent. of stomach cancers, while they were present in 20·8 per cent. of cancers in the large bowel. But Hauser finds that all forms of cylindrical cancer arise from adenomatous gland proliferation, which is at first simple in character, and presents itself as a small rounded thickening of the mucosa not much raised above the level of the surrounding mucosa and with a slightly uneven or warty surface. The adenoma is at first not ulcerated. Hauser describes these adenomatous changes as sometimes found in a high degree at the margin of chronic ulcers. There is evidently no essential difference between these flat areas of adenomatous proliferation and the stalked adenomata of similar structure, though the former may escape the observation of the naked eye. The edge and not the floor of a chronic ulcer is the part in which cancer arises, and the ulcer leads to cancer because it favours the production at its edge of adenomatous proliferation of the mucosa. I shall later suggest how gastric ulceration produces these precancerous adenomatous changes at its margin.

When it is remembered how small an adenoma may give rise to cancer and how rare are the opportunities of examining early gastric cancer, and when Hauser's observations on the adenomatous changes round chronic gastric ulcers are taken into account, there seens no difficulty in accepting the view that gastric cancer always begins as an adenoma strictly comparable with the warty growths seen on the skin in lupus or around a chronic ulcer of the leg. Konjetzny states that chronic polypoid gastritis precedes most cases of gastric cancer. P. Menetrier, after prolonged researches on the origin of stomach cancer, states that the sequence: chronic gastritis—adenoma—cancer is a constant one, and firmly believes that "cancer is a transformed adenoma; it succeeds to the adenoma and takes its place." I think we must accept this conclusion. He goes on:

> "What we have said about the formation of cancer in the gastric mucosa, we could repeat for the liver, the kidneys, the uterus, the skin and its glands, the breast, and for all epithelial organs and tissues.....but we have gone more into detail concerning gastric neoplasia because it was the subject of our particular study, and because the stomach lends itself better than any other organ to this kind of demonstration."

Small Intestine.—This part of the intestine, by its high absorptive power, is subject in a maximal degree

[1] The Relation of Malignant Disease to Benign Tumours of the Intestinal Tract, Brit. Med. Jour., 1929, ii., 567.

[2] Das chronische magengeschwür, Leipzig, 1883.

to irritations arising from food products, yet is almost immune to carcinoma except at its lower end. I want to associate this fact with the unique activity of lymphatic absorption in this part of the intestine, a physiological fact which surgeons can frequently verify during laparotomies when they see the white lines of the lacteals. It can hardly be an accident that where the lymph circulation is at its maximum the incidence of carcinoma is minimal. The converse of this proposition is my theme to-night.

Large Intestine.—It has long been known that intestinal polyposis, in which multiple-stalked adenomata are found along the large bowel, is a familial disease the tendency to which is strongly hereditary. Lockhart-Mummery, Jüngling, and others have published striking family histories, covering several generations. Its connexion with malignant disease of the bowel is so close that Lockhart-Mummery states that he has never known a case which did not develop malignant disease. In one family, he records, seven out of nine children of a father who had cancer of the bowel also died of cancer of the bowel between the ages of 30 and 54. A grand-daughter at the age of 31 submitted to complete colostomy for multiple polypi. Intestinal polyposis appears to be a rare disease, while cancer of the rectum is a relatively common one. Nevertheless Lockhart-Mummery suggests it as possible that all cancers of the bowel arise in a polypus. "A careful examination of specimens of cancer of the rectum shows that in quite a number part of the tumour is a simple non-malignant adenoma, though the remainder may be typical adenocarcinoma." [3]

It must not be forgotten that a single very small polypus or flat adenoma may form the basis of a carcinoma of the bowel. On two occasions I have seen a tiny polypus appear at the margin of a colostomy opening. In the first case I left the polypus alone, and when I saw the patient again, some months later, carcinomatous stricture of the colostomy had developed. In the second case I excised the polyp a few weeks after it first appeared. It was already becoming broad-based and indurated, and on section, though only ¼ in. in diameter, it was an early carcinoma.

Dukes has investigated the frequency of coincident papillomata in a series of 75 specimens of cancer of the rectum, dividing the cases into three classes: (*a*) submucosa only infiltrated; (*b*) muscular coat infiltrated; (*c*) the perirectal tissues infiltrated. Class A contained one case, which was associated with papillomata, Class B contained 18 cases, nine of which were associated with papillomata. Class C contained 56 cases, of which 17 were associated with papillomata. For the early, intermediate, and late cases the respective percentages were 100, 50, and 30. Thus papillomata are commoner in the early than in the late stage of rectal cancer, and are not a secondary product of the irritant discharges of the growth. Furthermore, according to Dukes, these facts indicate that soon after a carcinoma originates, papillomata in its neighbourhood tend to atrophy and disappear under some obscure process of immunisation.[4] Dukes has furthermore clearly shown that carcinomatous degeneration may occur in very small polypi. The change appears to begin at the free end of the polyp. W. Susman, of Manchester, among 883 necropsies, found 38 cases (4·3 per cent.) of polypi of the colon. Polypi were associated with gastro-intestinal cancer in 14 of these cases, with cancer elsewhere in three cases. Carcinoma of polypi of the colon was observed in four instances of multiple polyposis. In Dr. Susman's opinion there is a common cause for gastro-intestinal cancer and polypi.[5]

Breast.—Sir Lenthal Cheatle, by patient and accurate work with a giant microtome for cutting sections of the whole breast, has placed our knowledge of precancerous conditions of the breast epithelium upon a secure footing. He shows that these changes are often confined to one particular lobe of the breast, a fact suggesting the intrusion of some extrinsic agent such as a parasite or bacterium, and furthermore that they affect mainly the small ducts just before they open into the acini. He divides epithelial hyperplasia as seen in the breast into two varieties, desquamative and dysgenetic, and he appears to regard the first variety as the precursor of the second. In desquamative hyperplasia the cells are cast off into the interior of the ducts and the process does not appear to merit the term hyperplasia, but is rather a catarrh with retained products—probably, I suggest, due to bacterial infections along the ducts, and comparable to catarrh of the uterine cervix or of the nose. The "dysgenetic" hyperplasia of Cheatle may be less equivocally described as a papillomatous hyperplasia. In it three stages are seen:—

1. The individual cells remain normal but papillomata are produced within the acini and terminal ducts. The acini are never thus affected alone.
2. The individual cells show the signs of incipient malignancy (hyperchromatosis, variation in size, mitosis).
3. Infiltration of the tissue around the ducts and acini by the altered epithelium is beginning.

Clinical carcinoma and precancerous papillomatous hyperplasia were frequently found in the same breast. Cheatle points out the exact analogy of these processes with the changes seen in experimental tar carcinoma. In a case of tar carcinoma with papilloma formation but without infiltration, Dr. J. A. Murray inoculated the epithelium of the papilloma at a fresh site and produced a growth which metastasised. Cheatle infers by analogy, and rightly I think, that in the second stage of the hyperplasia in the breast the epithelium of the papilloma is essentially malignant, though it has not found an opportunity to infiltrate.

It is possible, I find, to distinguish the simple from the malignant papilloma of the breast, not only by the character of the individual cells but by the picture presented by the papilloma itself. In the simple papilloma the pattern is regular and the vascular core, though branched and complicated, is easily traceable in continuity, and is covered by a regular and usually one-layered epithelium. In the following two cases I was able to demonstrate the occurrence of carcinomatous degeneration in a duct papilloma which had apparently only existed for a very short time. In the first case at the time of the operation the papilloma was affected by carcinoma, but the disease had not yet attacked the tissues of the patient herself.

CASE 1.—A married woman, aged 70, noticed a serous discharge from the left nipple a week before she was first seen on June 12th, 1928. The breast was normal on palpation except that, vertically half an inch below the left nipple, a tiny very superficial shot-like swelling could be felt. Pressure at this point made fluid exude from the nipple. No other nipple changes were found. There were no glands in the axilla. On June 15th, 1928, this lump was cut down upon, two dilated ducts were exposed, divided close to the nipple surface, and then again divided where they began to ramify in the breast substance. On section of the excised portion across the ducts a small papilloma, just visible to the naked eye and perhaps one-fiftieth of an inch in diameter, was found within the duct, attached to it by a slender pedicle. A section across the tissue showed that this minute and early morphological papilloma had already become a carcinoma within its own substance. The fibrous tissue of its core was infiltrated with carcinoma cells, though there was no evidence that the physiological tissues of the patient had been attacked by the disease. The pedicle of the papilloma, fortunately included in the section, was composed of fibrous tissue only, and showed no infiltration.[6] An indication of the pathogenesis of the papilloma was, however, given upon examination of the pedicle. It showed several cylindrical groups of round-celled infiltration, some cut as circles, others as ovals. In company with one of the groups was a small artery. These are exactly the appearances given by blocked lymphatics which have lost their lumen by proliferation of their endothelium, as I know from my experience of lupus and elephantiasis. In other words, the patient had suffered from a chronic lymphangitis of the tissues of the breast, and it appears

[3] THE LANCET, 1925, i., 427.
[4] Brit. Med. Jour., 1929, ii., 196.
[5] Ibid., 1929, ii., 196.

[6] Illustrations of this growth will be found in my article on Lymph Stasis the Precursor of Cancer, Brit. Med. Jour., Oct. 5th, 1929.

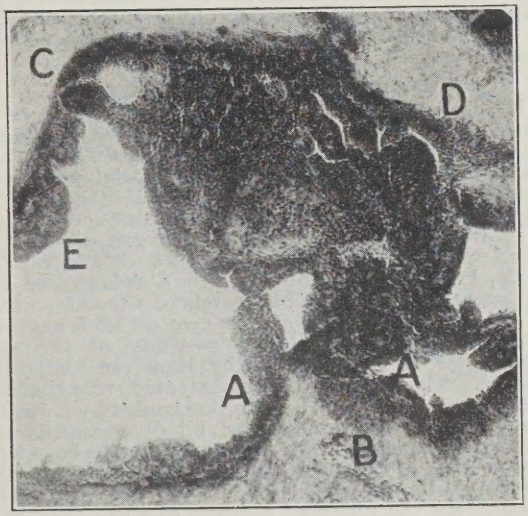
highly probable that the resulting lymph stasis was the cause of the papilloma which so rapidly developed into a potential carcinoma.

CASE 2.—Aged only 38, a married woman with two children, the younger aged 4, and neither of them breast-fed, noticed a tiny lump just to the inner side of the right nipple; she remembered having felt a pain in this situation a year previously. Two months after its appearance the lump was excised by Dr. H. Simmons, of Bournemouth. It was as large as a small pea, and felt hard. Its wall was rather thick, and it contained two drops of fluid. A section showed a tiny group of papillomata springing from the wall and projecting into the cyst, which had the characters of a dilated duct. The papilloma group had an irregular and confused structure, and was composed mainly of epithelium. The fusion of two or more papillomata to form it was indicated by the presence of several distinct pedicles (Fig. 1). The erosive power of the papilloma is seen at C, where it has partly penetrated the epithelial lining of the duct, and at D, where the same process is complete. The point C is represented under a high power in Fig. 2, and at A in that figure the epithelium of the papilloma has begun to fuse with the epithelium lining the duct. At E in Fig. 1, incipient papillomata are seen, and at B in the same figure the epithelial lining of the duct is infiltrating the underlying connective tissue. B is represented under a high power in Fig, 3, where F marks the limit of the epithelial infiltration.

This early carcinoma, for as such it must be classified, was about two months old. Infiltration was present outside the wall of the duct at one point. The papilloma group showed its essential malignancy by (1) interfusion of adjoining papillomata; (2) infiltration of the vascular core of the papilloma by epithelium; (3) erosive action of the epithelium of the papilloma on the epithelium of the wall of the duct; (4) a simultaneous process of fusion of the two epithelia, and (5) hyperchromatosis and irregularity in size of the epithelial cells.

These two carcinomas are probably among the earliest ever removed at operation. Each was characterised clinically by a tiny mobile lump, unaccompanied by any other sign of cancer. The

FIG. 1.

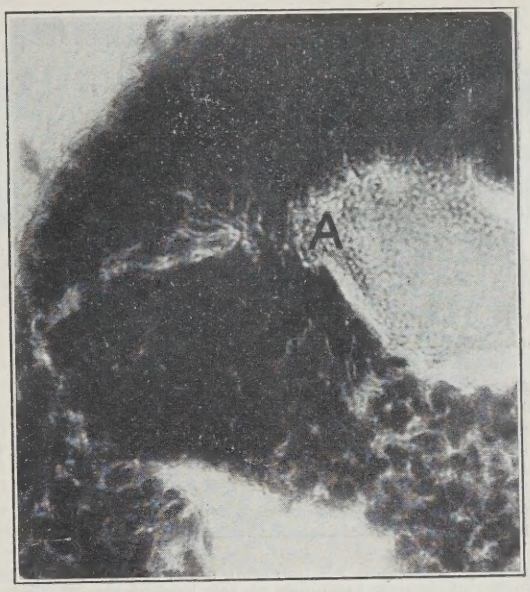


Case 2.—Incipient malignancy in a group of papillomata lying within a duct of the breast.

first patient, however, had hæmorrhage from the nipple. In the first case the carcinoma affected the papilloma only and had not attacked the tissues of the patient. The second case is a slightly later phase. The only rarity in these two cases consists in their very early detection and removal. They illustrate well the difficulty of early diagnosis in cancer of the breast, and the origin of the disease in duct papilloma of the large ducts. As Cheatle has shown, it is more common for papilloma to start in the small ducts near the glandular acini. I may add that the first patient remains well two years after operation.

Lupus Carcinoma.—Lupus carcinoma was first recorded by Devergie in 1857, long before the discovery of X rays, and I have seen at least three cases which had never been subjected to radiation. The disease is not very rare, for K. Asihara was able to collect 122

FIG. 2.



Penetration of the wall of the duct by the papilloma seen at C in Fig. 1. (× 440.)

cases. Persistent X ray treatment may no doubt accelerate its onset. In a case recently under my care a lupus carcinoma of the left cheek was associated with an innocent wart on the right cheek. The non-ulcerative forms of lupus usually show papillary hypertrophy, and when this is marked the name lupus verrucosus becomes appropriate. It seems probable that all lupus carcinomas originate in areas of papillary hypertrophy.

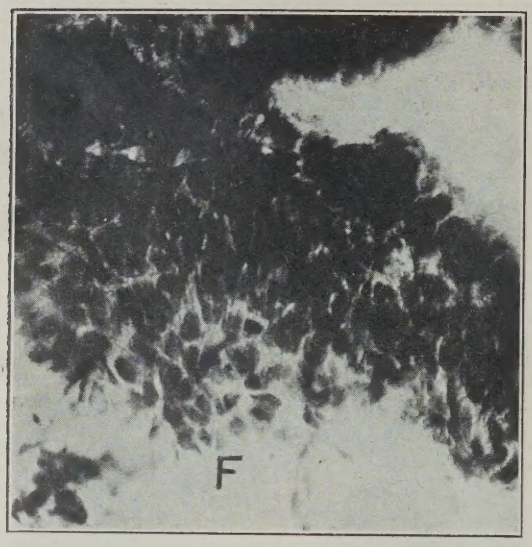
Carcinoma of Chronic Ulcers.—Carcinoma may arise upon the margin of an old chronic ulcer of the leg. The neoplasm is preceded by chronic thickening and warty hypertrophy of the surrounding skin. The papillomatosis may reach an extreme degree, as in a case recently published by W. Donald Bedford.[7] In this case the ulcer had been present for 25 years, and the papillomata presented no definite sign of malignancy.

Thyroid.—During the last few years brilliant work upon the thyroid gland and its relations to the lymphatic system has been done in this college, on the side of comparative anatomy by the physiological curator Mr. R. H. Burne, and on the side of pathology by Dr. G. Scott Williamson and Miss I. H. Pearse, whose studies have illustrated once more the unexhausted possibilities of morbid histology. They have shown that multiple adenomata of the thyroid, a condition which they prefer to call simple hyperplastic goitre, occur as the result of a process of focal perilobular fibrosis. I believe this term to be an alias for chronic lymphangitis. These adenomata present the appearances of a simple local hypertrophy of the gland tissue, and are a reaction against the lowering of the thyroid function which the fibrosis produces. This form of thyroid enlargement is the one particularly liable to lead to malignant disease. In four out of 20 such cases in Williamson's experience removal of part of the goitre was followed by cancer

[7] Brit. Med. Jour., 1929, ii., 1108.

of the adenopapilliferous type. "In three other cases the central lobules . . . . . showed changes quite indistinguishable from adenopapillomata." [8] The author goes on to state that in the thyroid the adenopapilloma and papilliferous carcinoma resulting therefrom are analogous to the similar growths seen

FIG. 3.



Represents the region AB in Fig. 1 under a high power, and shows infiltration beginning at the base of the papilloma. (× 440.)

in the breast, prostate, ovary, and other organs. The scirrhous form of cancer is relatively rare.

The evidence for the onset of thyroid carcinoma from papilloma thus appears to be convincing. Even the scirrhous forms may have such an origin. I may remark in passing that the cramped conditions under which the thyroid adenomata grow are ideal for the aggravation of local lymphatic obstruction.

Occupational Cancer.—Percival Pott, who described sweep's cancer of the scrotum 150 years ago and thus laid the foundation of our knowledge that cancer is at first a local disease, pointed out that the malignant growth originates in a simple wart. Leitch, who has specially studied occupational cancer and who detected the action of the sebaceous secretion of the scrotum in dissolving an active agent from the soot particles, points out that the kangri cancer of Kashmir, the cancer of the cheek and gums which results from the habit of chewing betel-nut, arsenic cancer, and aniline cancer of the bladder, are all associated with preceding papillomatous formations.[9]

PAPILLOMA AND EXPERIMENTAL CANCER.

Fibiger, in 1913, showed that a squamous carcinoma of the stomach could be produced by feeding rats with cockroaches infected by a certain nematode worm. This form of cancer is called spiroptera cancer. He says: "The disease consists in its initial stage of epithelial hyperplasia and inflammation. In more advanced cases papilloma formation supervenes; it may reach a colossal development, and may fill up the whole cavity of the stomach. This may be the precursor of a malignant epithelioma with invasive heterotopic growth of epithelium. Metastases may occur, in which no parasites or eggs were found." The thread-like worms are found burrowing in the epithelial layer, and Fibiger lays no stress on the changes found in the submucosa. Nevertheless, he says: "everywhere in the submucosa inflammatory appearances were seen in a greater or less degree." Examination of his photographs shows, below the epithelium in the superficial part of the submucosa, a band of round-celled inflammation which in my opinion indicates a lymphangitis, and this opinion is confirmed by the gigantic papillary hypertrophy, a clear indication of lymphatic obstruction. The rôle of the spiroptera, burrowing about in the epithelium, is exactly comparable to that of the infected needle, which may set up an acute or chronic lymphangitis. But neither in the spiroptera nor in the bacterial parasites it carries is there any specific carcinogenic agent. The specific factor, as I shall endeavour to show, is the resultant lymphatic obstruction.

The evidence that a papilloma or an adenoma is a very frequent precursor of cancer could be multiplied, if time allowed, by the consideration of other forms of cancer. There is, however, an earlier stage in the cancer process which we must now consider briefly.

Pre-Cancerous Inflammatory Changes in the Sub-Epithelial Tissues.—There is abundant evidence that the epithelial proliferation characteristic of carcinoma is preceded by chronic inflammatory changes of ancient date in the underlying connective tissue. Such is the testimony of Waldeyer, Ribbert, Borrmann, Menetrier and, in this country, of my colleague, Victor Bonney,[10] who made a close study of the connective tissues in carcinoma. As Bonney says, the hypertrophy of the epithelium only develops after the sub-epithelial changes are established, and these changes are invariably characterised by increased cellularity. Billroth said: "Without previous chronic inflammation, cancer does not exist." These changes, it should be noted, precede papillomatosis. They must be significant. Their occurrence has remained a basic but isolated fact not related intelligibly to the rest of the story. Some observers, especially Lenthal Cheatle, have minimised their importance. I want to suggest that they are the result of long-standing local chronic lymphangitis, a process which in elephantiasis produces extreme hypertrophic changes in the connective tissues, associated with papillomatosis.

PATHOLOGY OF THE PAPILLOMA.

If a papilloma is a very frequent forerunner of cancer a study of the pathology of the papilloma may be one line of approach to the most important and baffling problem of pathology, the origin of cancer, a problem which has hitherto defied all attacks. The genesis of a papilloma cannot be understood without a knowledge of the lymphatic arrangements of the skin. Some years ago, in the course of a lecture on lupus, I showed in this theatre a scheme of the arrangement of the lymph vessels of the skin, which I had inferred partly from my own direct lymphatic injections but mainly from a study of the skin lymphatics as mapped out by lupus or malignant disease. The main facts demonstrated were that the axis of each papilla of the skin is occupied by a central lymphatic vessel terminating blindly towards the apex of the papilla, but joining below its base with four or five more similar lymphatics from adjacent papillæ as the fingers join the hand to form a single vessel. By the union of a group of these vessels in the superficial third of the thickness of the dermis, horizontally running lymphatics are formed which, uniting by groups and changing their direction, pierce the deeper layers of the dermis, again unite by groups in the subcutaneous fat, and run vertically through the fat to join the fascial lymphatic plexus (Fig. 4).

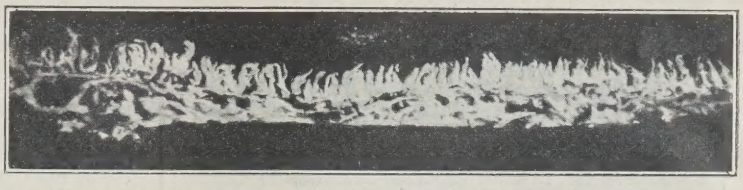
It is a satisfaction to me this evening that I can place before you independent evidence of the broad truth of this description of the skin lymphatics. Prof. D. T. Harris, of University College, drew my attention to a specimen of skin, showing the lymphatics injected, presented many years ago to the Museum by Prof. Hyrtl, of Vienna. The specimen attracted

[8] Jour. Path. and Bact., 1925, xxviii.
[9] Cancer Control: Report of Lake Mohonk Symposium, 1927, p. 208.
[10] Arch. of the Middlesex Hosp., 1908, xiii.

no particular attention, though it is a beautiful example of the "lost" art of lymphatic injection, and so far as I know Hyrtl never published a description of the minute lymphatics of the skin. It confirms in all important particulars the description of the skin lymphatics which I gave in 1921, and places the minute lymphatic anatomy of the skin upon an unassailable basis. The entire pathology of diseases of the skin will require reconsideration in the light of this specimen (Fig. 5).

Each papilla of the skin is provided with a separate drainage system, and the lymphatic vessel lies in the axis of the papilla but is always separated from the overlying epithelium by a thin layer of connective tissue. Furthermore, if the fibrous layer of the skin is considered, nearly all the lymphatic vessels are found in its superficial third. In the deeper two-thirds of the dermis the lymphatic vessels are comparatively scanty, and run vertically, in company with the blood-vessels.

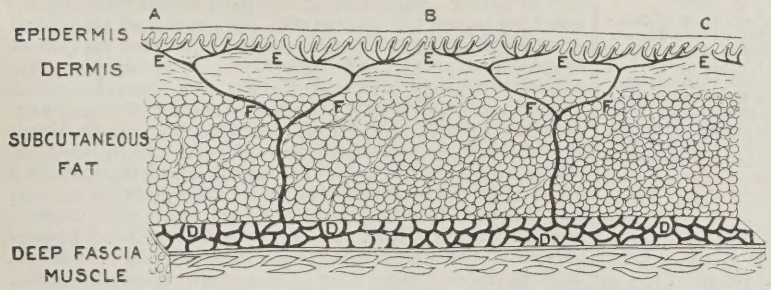
FIG. 5.



A section of skin under a low magnification in which the papillary lymphatics, completely injected, are seen above. This specimen was presented to the Museum of University College many years ago by Prof. Hyrtl, of Vienna.

With these anatomical facts I want to correlate certain pathological facts. In elephantiasis a band of round-celled infiltration is often seen in the superficial third of the dermis. Lupus affects, at first exclusively, the superficial third of the dermis. In Paget's disease of the nipple a band of round-celled infiltration is often found in the superficial third of the dermis. In moles the characteristic cells, called by the Germans "nævus cells," affect the superficial third of the dermis without ever quite reaching the epithelium. I ask you to infer that all these conditions are genetically related to the lymphatic system. In the case of elephantiasis no proof is needed. In favourable cases of lupus and Paget's disease I have given direct visual proof in earlier lectures in this theatre. Lupus is a tuberculous lymphangitis. Paget's disease depends initially upon cancerous permeation of the lymphatic vessels of the skin, and later shows fibrotic destruction of these vessels with the typical band of round-celled infiltration. Now all these conditions are associated with papillary hypertrophy or with the appearance of papillomata. This can hardly be an accident. There is evidently some very close relation between lymphatic obstruction and the genesis of a papilloma. Here we may turn aside for a moment to consider the accepted views upon the pathogenesis of a papilloma.

FIG. 4.



To show the lymphatic arrangements of the skin. A schematic vertical section of the skin and subcutaneous fat, with a small horizontal shelf of deep fascia projecting forward from it. Below this is muscle in vertical section. AB and BC are two of the primary lymphatic areas of the skin. These areas measure one-third to half an inch in diameter, and the only lymph-vascular communication between them appears to be by way of the subjacent fascial lymphatic plexus DDDD which is seen on the flat. The lymphatic end-sacs of the skin papillæ unite by groups of five or six to form small lymphatic vessels, which again unite in the superficial third of the dermis (plane of primary confluence EEE) to form other lymphatic vessels which pierce the dermis vertically and unite just beneath it (plane of secondary confluence FFF) into a smaller number of vessels which run down through the subcutaneous fat to discharge into the fascial lymphatic plexus DDD. (Handley: "Lupus in its Surgical Aspects," Annals of Surgery Jan., 1922.)

Accepted Views on its Pathology.

To obtain these views we must turn to the volumes of dermatological pathology dominated by the oracular Unna, who decides questions of cutaneous pathology by an intuitional process.

Unna objects entirely to the term papilloma, and wishes to substitute the word acanthoma, because he considers that the primary factor in a papilloma is a proliferation of the prickle epithelium.[11] In my opinion this sterile conception must be replaced by one based on anatomy and physiology. As I said in an address given last year in New Zealand, "the papilla is a little physiological engine. From its blood capillaries there exudes into its connective tissue a constant nutritive stream of dilute blood plasma at a certain pressure. The excess of fluid is removed and the equilibrium maintained by the drainage action of the central lymphatic. Block this lymphatic and what will happen? The first effect will be a rise in the pressure in the intercellular spaces of the papilla, and on ordinary hydraulic principles the papilla will increase in size until the intercellular pressure is equal to the pressure in the capillary blood-vessels. A second effect will be overnutrition and consequent proliferation of the papilla itself, and of the overlying epithelium."

This view is based upon certain observations made in cases of warty or non-ulcerated lupus which I must briefly summarise. They are simple and, I think, convincing. In such an area of lupus, if the length of the papillæ is measured they are found to be slightly hypertrophied at the edge of the patch, but as its centre is approached they show a gradual increase in length up to ten times the normal. If now the skin is examined immediately beyond the edge of the patch of lupus there is no definite papillary hypertrophy, but the central lymphatic of each papilla, though still anatomically recognisable, is seen to be blocked by proliferative tuberculous lymphangitis (Fig. 6). There is no other abnormality to be detected in the tissues. The inference I draw, and it seems an inevitable one, is that the blocking of the papillary lymphatic has established the necessary conditions for papillary hypertrophy and wart formation—changes which in the centre of the patch of lupus have had time to reach their full development. It is true that I have not blocked a papillary lymphatic and seen a papilloma arise but, short of experimental demonstration, the proof of origin could hardly be more conclusive. The elongation of the papillæ in a papilloma is not due to the downgrowth of the

[11] Histopathology of the Skin, trans. N. Walker, 1896, p. 671.

interpapillary cell columns for, as has been noted by other observers, the relation of the deepest part of these columns to the hair follicles deeper down remains unaltered. Moreover, in conditions of papillomatosis the interpapillary epithelial cell columns tend to atrophy and disappear, a clear proof that their rôle is a passive one. They are the victims, not the agents, of pressure.

If the tubercle bacillus, by setting up a local area

FIG. 6.

A section (× 95) taken from near the edge of an area of non-ulcerative lupus, lying beyond the visible edge of the disease in apparently normal skin. The lymphatics of the skin nevertheless show advanced proliferative lymphangitis. A group of the lymphatic end-sacs, which lie in the skin papillæ, is seen uniting in the plane of the section to form one of the vertically running lymphatics which pierce the dermis. To the left is seen another Y-shaped lymphatic junction, which also is converted into a solid cord of cells by proliferation of its endothelium. (Handley: "Lupus in its Surgical Aspects," Annals of Surgery, Jan., 1922.)

of chronic obstructive lymphangitis, can produce papillomatosis and finally carcinoma, is it not likely that other bacteria which are known to produce a subepithelial chronic inflammation, followed by papilloma and cancer, also act by producing a local lymph block?

Malignant Tumours Arising From Congenital Skin Malformations.

The local congenital malformations of the skin called nævi in France and Germany, and in this country described as nævi only if vascular but otherwise as moles or warty moles, are known to be seats of election for malignant tumours, especially if they are subjected to irritation.

But malignant tumours may arise in nævi without any precedent process of chronic inflammation, such as is usually seen in other cancers. There would appear, therefore, to be a factor at work in nævi which acts as a substitute for chronic irritation and inflammation. What is it? A study of the minute anatomy of the pigmented nævus shows that the characteristic nævus cells, closely aggregated pigmented or unpigmented connective tissue cells, occur chiefly in the superficial third of the dermis, the layer which we have already recognised as the lymphatic zone. This fact suggests that the nævus is an area in which the cells which should produce the lymph vessels have proliferated irregularly and have failed to form the normal lymphatic network. This conclusion is confirmed by the frequency of papillary hypertrophy, which in the typical warty nævus reaches a high degree of development. The excess of pigment in nævi also indicates some defect in metabolism, and can also be interpreted as due to a defective circulation of tissue fluid, such as would result from lymph stasis.

You may look upon these arguments as special pleading. Let me therefore say that a number of distinguished pathologists have independently come to similar conclusions. Von Recklinghausen, Bauer, and Borst[12] all hold that the peculiar nævus cell groups found in moles are produced by proliferation of the endothelium of the lymph vessels and spaces. Von Recklinghausen gave to moles the name lymph-angiofibromata. Borst found in moles lymphatic vessels still recognisable but partly filled up with nævus cells, pigmented and unpigmented. He could also recognise thickening and proliferation of the endothelium of the lymph vessels. On the other hand, he found no such changes in the blood-vessels. Warty or papillomatous moles are liable to give rise to squamous-celled carcinoma. Renoul,[13] among 121 examples of tumours arising from nævus, found 34 carcinomas. Melanotic sarcomas arise from them even more frequently, and mixed carcino-sarcomas have been recorded.

There is very good reason for considering that the liability of moles to malignant change is due to a local lymph block of congenital origin.

RECENT CANCER THEORIES.

The two most recent general theories of the origin of cancer are those of L. Kreyberg, of Oslo, and A. Lumière, of Paris. Kreyberg has shown by very neat methods that areas irritated by tar exhibit, in the precancerous stage, a dilatation of the cutaneous vessels associated with increased transudation of serum into the tissues. This hyperæmia comes immediately after the tar application and after the first application disappears within 48 hours, but after later applications is more and more persistent. It is not of reflex origin but is ascribed hypothetically to local injury of the contractile apparatus of the small vessels. Capillary ectases appear at the end of a month and precede the development of warts. The affected vessels are capillaries and venules, and thrombi are frequently seen within them, without any evidence of proliferation of the vascular endothelium. Polymorphic leucocytes, later replaced by lymphocytes, wander into the tissue of the corium and subcutaneous fat within two days of the first tar application, and the fibrous bundles increase, so that the corium becomes fibrous and rich in cells. A diffuse hyperplasia of the epidermis develops within a few days, but is later than the connective fibre changes. Painting with spirit of mustard or with hot water at 60° C. led, on the contrary, to a transient hyperæmia, with later degeneration of the epidermis and the production of scarred corium, poor in cells.[14]

Kreyberg finds in the power of tar to cause lasting hyperæmia the secret of its power to cause cancer, and ascribes to hyperæmia a predominant rôle in the production of malignancy. He finds in the persistent "irreversible" dilatation of the vessels the factor which may cause cancer even though the application of tar be stopped. He remarks that human cancers originate at the time of life when vascular degeneration is frequent and in organs which are intermittently functional and subject to great circulatory alterations, such as the uterus. His work takes no account of the lymphatic vessels, and it cannot be right to omit from consideration such an important anatomical element in the skin. Chronic hyperæmia seems too wide and general an agency to be invoked as the

[12] Die Lehre von den Geschwulsten, 1902, i., 117 and 453.
[13] Thèse de Paris, 1892.
[14] Virchows Arch., 1929, cclxxiii., 367.

cause of cancer. This is not to belittle the importance of Kreyberg's observations, but they may be an isolated chapter of the story of which I believe I have given a more complete and documented account.

It is evident that inflammatory hyperæmia must accompany the earlier stages of a chronic lymphangitis. As to the later persistent hyperæmia, it so happens that in my study of lupus I have already described the vascular dilatations, followed by vascular restriction, which Kreyberg has described in the later stages of tar-painting. I ascribed them in lupus to the comitance of lymphatics and blood-vessels. From this anatomical circumstance it inevitably arises that the fibrous changes of a chronic lymphangitis and perilymphangitis produce pressure at first upon the comitant vein with vascular congestion and increased transudation, and later upon the arteries with vascular constriction, followed by necrosis. It will not escape notice that the early changes in the corium described by Kreyberg precede the epithelial and vascular changes, and that they are precisely those which are already known to occur in a lymphangitis of tuberculous origin. Kreyberg's observations are thus an independent confirmation of my own, and are especially important as showing that the very first effect of tar-painting is seen in the lymphatic region of the corium, and that the earliest epithelial changes come later. Kreyberg's theory offers no explanation of the close association between papilloma and cancer, which on my view receives an easy and natural explanation.

According to Lumière [15] the essential preliminary for the production of cancer is a scar. This is untrue if the word "scar" is used in its clinical and ordinary sense. It is probably true, except in the case of moles, that microscopic processes of subepithelial chronic inflammation which lead to the formation of scar tissue invariably precede a carcinoma. That mere scar-formation is not the cause of cancer is, however, shown by the extreme rarity of malignant growths in the scars of "clean" surgical operations, where the conditions for the infection and subsequent obliteration of lymphatic vessels have been excluded by the surgeon's precautions. The hypothesis of Lumière fails by its vagueness and its limited applicability, though it contains an element of truth.

It is to be noted that not one of the theories of the origin of cancer hitherto current applies equally to cases originating in chronic infections, in chemical irritations such as those of tar, and in malformed areas of skin. Parasitic theories fail to explain tar cancer. Cohnheim's theory fails to explain the origin of cancer in such conditions as chronic gastritis. Chronic irritation and parasitic theories fail to explain the special liability of moles to become malignant.

The occurrence of papillomatosis preceding every variety of carcinoma suggests for all three classes of growth a similar pathogenesis, and points to chronic lymph stasis as the x of the problem. Congenital malformation of lymph vessels and pathological obstruction of them have, as might be expected, the same effect.

A. Leitch has stated that cancer is due not to one cause but to many. I believe this is a superficial view and that these multiple and alternative chains of causation will be found to converge to a single line of links which leads through local lymphatic obstruction—often manifested by papillomatous hypertrophy—and certain consequent metabolic changes to the onset of a carcinoma, and that not otherwise can a cancer be produced. The language and thought of mankind upon the subject of causation is in a singularly muddled condition. Any given consequence such as cancer springs from a chain of previous events stretching back to infinity, and not from a single cause. But if among those events one can be detected which for a given consequence is very frequently present, and has never been proved absent, the clue to the problem of causation has been obtained, and this event may be provisionally and loosely spoken of as the cause. In this sense I am bold enough to claim that lymphatic obstruction is the cause of cancer, though the labours of generations may be required to trace the intermediate steps. The evidence for this view is so substantial that it may claim to rank not as a hypothesis but as an established theory—that is to say, as the solvent and unifier of all the relevant facts hitherto observed and the guide to future research upon the subject. My part in this theory has been to explain the real pathology of the papilloma and to demonstrate the lymphangitis-papilloma-carcinoma sequence in lupus carcinoma. Had this been all, the theory would have remained a plausible hypothesis proved only for lupus cancer. It has been raised to the rank of a theory by successive waves of evidence, coming in like a tide from independent observers and referring to distinct varieties of carcinoma, but all bearing testimony to the genetic relationship of papilloma or adenoma and carcinoma. Some of these observers have been surgeons, some pathologists, but I am glad to observe, as showing that the originality of our nation is not exhausted, that most of them have been English. I mention the names of Hurry Fenwick, Lenthal Cheatle, Cuthbert Dukes, Lockhart-Mummery, M. J. Stewart, G. Scott Williamson, and I. H. Pearse.

I rejoice in these facts for another reason, because they show the continued vitality of morbid histology. The phase of dangerous neglect through which this subject has passed is giving place to renewed interest, though academic recognition of its importance and dignity is still to seek. I continue to hope for the time when this building will contain a histological museum equal in importance and authority to its collection of naked-eye specimens. As Prof. C. Regaud said of morbid histology, "Not only does it lie at the bottom of all classifications that we make, and play a preponderant rôle in diagnosis, but it has also become the indispensable guide of all who devote themselves to the difficult problem of the biological action of radiations"—a subject of very immediate importance now that radium is coming into its kingdom.

Does Lymph Stasis Precede Sarcoma?

The peculiar relations of epithelium to the underlying connective tissue provide, in the precancerous papilloma or adenoma, an early criterion of the existence of lymph stasis. No such criterion is available in the case of the sarcomas, which arise not upon surfaces but in the depths of the connective tissue. The problem of presarcomatous conditions has hardly been approached. Nevertheless there are indications that forces of the same order as those which produce carcinoma may also produce sarcoma. Warty moles may become the seat either of a carcinoma or of a sarcoma, or of a carcino-sarcoma. Some experimenters, while trying to produce carcinoma by injecting tar, have produced instead a sarcoma. It may at any rate be said that the application of the lymph-stasis theory to sarcoma presents no difficulty, except that in the sarcomas of young children the normal snail's pace of the genetic process of cancer must have been much accelerated.

Conclusion.

To sum up, the genesis of cancer has been linked up firstly with a predominant extrinsic factor—chronic irritation either of bacterial, viral, parasitic, or physical origin; secondly, with a predominant morbid anatomical factor—papillomatosis or adenomatosis; and, thirdly, if you accept my conclusions, with a predominant physiological factor—local lymphatic obstruction. Finally, if the work of Warburg holds good, the genesis of cancer is intimately linked with a biochemical factor, a change-over on the part of the precancerous cell from nutrition by oxidation to nutrition by hydrolysis. It is easy to imagine how this change may be imposed upon the cell by conditions of lymph stasis. Is it too much,

[15] A. Lumière: Le Cancer, Maladie des Cicatrices, Paris, Masson et Cie.

then, to say that the main outlines of a solution of the ætiological problem of cancer are visible through the mist? Concordant facts have an unmistakable music of their own, which even Beethoven cannot excel.

Menetrier has divided theories of the origin of cancer into two classes: (*a*) the parasitic theories, which seek the cause of cancer in a specific living agent reaching the body from without; (*b*) the cellular or cytophysiological theories, which lay stress upon the intrinsic modifications of organs and tissues. It will be seen that the apparently conflicting facts upon which the opposing views are based can be harmonised if it is admitted that various non-specific infections and chemical and physical irritations may set up a chronic local obstructive lymphangitis which in the course of years profoundly modifies the vital processes of the surrounding cells. The circulation of tissue fluid is impaired, and in the obstructed district the cells no longer receive their due share of the products of the other cells of the body. They are deprived of the hormones by which the cell society exercises its influence upon the cell individual, and particularly of the hormone which limits cell division. Under these conditions it is not surprising that they may ultimately revert to the condition of the primitive unicellular organisms from which they are all descended.

You all remember the story of Mowgli as related by Mr. Kipling. Cut off from the influence of his kind and from the apparatus of civilisation, Mowgli made shift in the jungle by reverting to the habits of the primitive man, his ancestor. The story of Mowgli is a parable of the origin of the cancer cell. The analogy is incomplete. The cancer cell has reverted to the very beginnings of life, when all living beings were single cells, to a time when egotism, modified by an urge to voluntary bisection, was the only virtue. Such was the moral code required to preserve life through the cataclysms of the prime, and such to-day is the code of conduct of the cancer cell.

It has been said, for I said it myself, that man is omnipotent till he is 30, omniscient till he is 40, and immortal till he is 50. In the 25 years which have elapsed since I first held my present office—and I have held it eight times—I have lost the support of these delusions. But the younger generation of surgeons, the future holders of this chair, will find, as I have found, that attempts to advance knowledge in the service of this College and to present the results in a form fit for this critical audience are a source of abiding satisfaction, a satisfaction which survives the delusions of youth, and perhaps even outlives the fire of personal ambition and the thrill of professional success.

CLINICAL EXPERIMENTS WITH ŒSTRIN.

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Since many monographs [1] and reviews [2 3] dealing with the literature on the discovery, preparation, and physiological and chemical properties of this substance have appeared within the last year, it will only be necessary to refer very briefly to the outstanding points in this discussion. The fact that the ovaries play an essential part in the sexual cycle of animals has been known for generations in consequence of the obvious effects of castration in animals. During the last 30 years a continuous series of attempts has been made at substitution therapy, and, as in the case of other hormones, the outstanding landmark was found at that particular time when a definite method of testing the potency of the extract was discovered. The earlier workers employed such phenomena as enlargement of the uterus and growth of the genitals as a sign of the activity of their products, but it can easily be seen that this type of observation can rarely, if ever, be developed into a quantitative study. The most important observation was made by Allen and Doisy,[4] who were the first to apply Stockard and Papanicolaou's[5] vaginal smear method to the study of the activity of ovarian extracts. This reaction is the one by which the material at present under discussion is standardised.

It was shown by these workers that if daily vaginal smears were made from small rodents, such as the rat and the mouse, a series of cyclical changes occupying about three days was found. This phenomenon is known as œstrus and can be divided into three stages—pro-œstrus, œstrus, and meta-œstrus. The cellular changes occurring in the smear are characteristic for each stage; in the resting stage can be seen leucocytes and degenerating cells; in pro-œstrus the leucocytes begin to disappear and epithelial cells in various stages of cornification take their place; at the height of œstrus the leucocytes have vanished and the smear consists of eosin-staining cornified cells which have lost their nuclei; in meta-œstrus retrogression appears, heralded by the appearance of leucocytes, and the reaction thus returns to the resting stage. If the ovaries are removed from the animal these changes cease, and the vaginal smear takes on the appearance of the resting stage, which is known as dicestrus. Allen and Doisy showed that the injection of extracts made with the use of volatile solvents would cause the cyclical changes to reappear, and this has been developed as a method of standardisation. The important point to realise is that there is a definite quantitative relationship between the amount of hormone injected and the changes in the vaginal smear, and that in this technique we have a certain method of assaying the hormone.

A great deal of controversy centred around the actual definition of the unit. The earlier workers employed the technique known as the "descending dose" method. This consisted of giving small quantities of the hormone to a series of rats and noticing the minimum quantity capable of producing œstrus in one or more animals. This type of method was vigorously attacked by Coward and Burn,[6] who showed that the possibility of error was in the region of many hundred per cent. on account of the great individual variability in the response of the rats to the substance. They proposed that a statistical technique should be adopted in which a series of rats, say 20 to 50, were given approximately the amount required to produce œstrus, the unit to be defined as that quantity of hormone capable of producing œstrus in 50 per cent. of the animals so tested. By this means the highly sensitive rats in the group were balanced by the relatively insensitive ones, and thereby an accurate method was produced. Although the importance of this work has not been fully realised, it is safe to say that the time is not far distant when the principles of the method will form an essential part of any standardisation of this type of product. The material described in this paper has been standardised on this principle and the results of Coward and Burn were very rapidly confirmed in these laboratories.

The importance of this work can readily be seen, for it provided the biochemist with a method of estimating the strength of his preparations in a quantitative manner and enabled him to proceed with the purification of the hormone. For example, the preparations some years ago were in the form of a stiff oil, insoluble in water, with a rat unit of some 10–15 mg. This substance was administered to animals dissolved in olive oil or else in the form of an emulsion, and various local and general disturbances resulted from its irritating characteristics and slow absorption. An animal that had been injected for a considerable period lost weight and developed ulcerating sores at the site of injection. The very properties of this substance forbade its use in clinical medicine, and the few isolated attempts that were made to inject it were all followed by severe local and general reactions which quite masked any possible therapeutic action. The purification of the material, however, has proceeded rapidly, with the result that to-day it is possible to obtain material containing several

hundred rat units to the milligramme. The product is sufficiently soluble in water to enable considerable doses to be injected subcutaneously into human beings without any local or general reactions.

Effects of the Water-soluble Hormone on Animals.

The effects of this water-soluble and highly active material are: (1) The production of œstrus in ovariectomised animals. (2) The production of premature puberty in young immature female animals. (3) The abortion of pregnant rats and mice when given in large doses subcutaneously. (4) All these phenomena have been noted when the material has been injected subcutaneously. No effects can be observed by oral administration unless relatively enormous doses are given.

This substance, which has been termed œstrin, is therefore a very powerful agent, capable of producing profound changes in animals, and it is known from a careful study of its effects on blood pressure to be at least harmless when given to human beings.

The gynæcologist has sought in an ovarian extract a substance capable of inducing menstruation in amenorrhœa, and many have claimed that œstrin has this power. It must, however, be clearly understood that there is little a priori reason to suppose that a substance capable of producing œstrus in the lower animals will therefore produce menstruation in women. The significance of the menstrual process is not understood and the relation between œstrus and menstruation is certainly by no means clear. We must not, therefore, set out with the idea that œstrin to be of any value must cause the onset of menstruation. Also, the relationship between parturition in animals and man is obscure. It is a well-known fact that abortion is induced very easily in normal animals, but only with considerable difficulty in normal women. Then, again, it might be hoped that œstrin would be able to replace the lacking ovarian function in the climacteric, but here, also, a word of warning must be given, as it is not definitely proved that the whole of the symptoms of the climacteric period are due to deficient ovarian secretion. It is important to be quite fair to the extract and not to expect it to induce processes which possibly bear only a distant biological relationship to those occurring in the lower animals. In the few publications that have appeared on the clinical use of œstrin the views expressed vary considerably. Thus, Shaw,[7] using the oily material, states, "the evidence that has been obtained shows that in some cases it is of no value whatsoever, and that its application is likely to be very strictly limited to but a few cases." Laqueur[8] and his co-workers using the water-soluble preparation, report very favourable results in certain types of cases.

Preparation Used in the Clinical Experiments.

The preparation employed in the clinical experiments about to be described was made by the process already published from these laboratories (Allan, Dickens, Dodds, Howitt[9]), and the product is manufactured and standardised entirely in our own department. It contains 10 rat units per c.cm. as estimated by the method of standardisation already described. (Allan, Dickens, Dodds[10].) The solution is clear, sterile, and water-bright, and the potency of the material is on the average 50–100 units per mg. The solution is preserved by the addition of tricresol, and when injected produces neither local nor general toxic reaction. Since experiments have shown that the rat unit is in the region of ten times the mouse unit, and the ratio of their weight is about 10:1, it would appear, arguing on a body-weight basis, that 300 rat units would be required to produce a corresponding physiological effect on a woman of average weight. It was decided to use the strictly limited supply of material in a series of daily injections, 1 c.cm. (10 units) being given on each occasion. The treatment was carried on for two months, and between 500 and 600 units in all were given to each patient. The aim was to give a series of small doses spread out over a considerable period rather than frequent large doses. This method was based upon animal studies, which had shown that a better response would be evoked by giving a series of small doses spread over a period of days than by giving one single large dose. The figure of 10 units per day was arrived at in a purely arbitrary manner and rests on no reasoned ground other than economic considerations. The production and standardisation is so extremely laborious and expensive that this was found to be the maximum amount of material that we could give to a series of cases.

Type of Case Treated.

The patients were referred to us from the gynæcological out-patient department, where they had been subjected to a careful pelvic examination, and from our point of view they could best be considered under the following headings:—

1. Patients with amenorrhœa; these for the sake of convenience may be divided into two classes: the unmarried and the married. These groups correspond roughly to primary and secondary amenorrhœa respectively.
2. Patients from whom both ovaries had been removed.
3. Patients in whom attempts were made to induce labour
4. Patients at the menopause.

Results of Treatment.

In the Table given below will be found the results of the treatment of all the cases which were injected with the hormone. Every patient to whom the substance was given has been included, so that there can be no question of any attempt at selection. In all, 78 cases of amenorrhœa have been injected, and 16 of these were unable for various reasons to continue treatment. The results in these 16 have not been noted, as it was felt that their inclusion would be misleading. We thought it advisable to consider the results under two main headings: first, the direct objective result—namely, the establishment of menstruation—and secondly, the effect of the substance upon the general health and spirits of the patient. Whilst the former is a matter of fact and can be expressed in figures and percentages, the latter is vary variable, and indeed, in our opinion, is of little or no value.

Amenorrhœa.

	Unmarried.	Married.
Cases treated	40	38
Number having full two months' course	32	30
,, in whom menstruation started	10	18
,, feeling better	30	29

The Table shows that menstruation started in 10 of the 32 unmarried women and in 18 of the 30 married women. In the successful cases the periods usually commenced within a week or ten days of the treatment and consisted first of all of a very slight bleeding, but this amounted to a full period in some. The bleeding was followed after three or four weeks by a full period, described by the patient as perfectly normal. The periods continued for at least six months, and these patients all felt a great improvement in their general health. It must be admitted, however, that those women in whom the periods did not appear also felt very much better. A series of experiments was conducted on some of these patients to control the psychological effect of giving injections, and in many cases excellent effects were observed after normal saline injections when the patients thought they were receiving the active preparation. The general tonic effect appears, therefore, to be largely due to suggestion, possibly associated with the fact that the patient was coming every day to the hospital for treatment.

Patients from whom Both Ovaries had been Removed.

Four patients were treated. From the first, aged 29, both ovaries had been removed on account of cystic disease and the uterus had been left untouched. The patient was seen five months after operation and had not had any periods. After the standard treatment, menstruation appeared in three weeks, and was followed by another period one month later. In this case the injections were carried on for five

months and the periods continued normally. Cessation of treatment, however, was followed by abrupt cessation of the menses. In another similar case, aged 32, the ovaries had been removed three months previously and the patient was suffering from marked menopausal symptoms. The results obtained were similar to those in the first case. The remaining two patients had undergone complete hysterectomy, together with removal of the ovaries, and were suffering mainly from vasomotor symptoms. Their ages were 35 and 38 respectively. In the former patient there was a definite leukoplakia vulvæ. In both patients the vasomotor symptoms were controlled and the local condition of the vulva in the first patient was greatly improved after three months' treatment. Unfortunately, sufficient material was not available to continue the treatment or to raise the dose.

Attempts at Producing Premature Labour.

In collaboration with Mr. L. C. Rivett three cases were treated at the Queen Charlotte Maternity Hospital. The results of these cases are described in detail below, and it will be seen that in only one was there any evidence that premature delivery had been effected.

CASE 1.—Primigravida, aged 26, expecting July 15th, 1928. Induction for ? placenta prævia, associated with persistent vomiting.

July 7th,	12.15	P.M.	Inj. 1 c.cm. placental extract.
	4.15	,,	,, 1 ,, ,, ,,
	8.45	,,	,, 2 ,, ,, ,,
	12.15	A.M.	,, 2 ,, ,, ,,
			Few weak pains during night.
,, 8th,	11.0	A.M.	Inj. 2·5 c.cm. placental extract.
	3.0	P.M.	,, 5 ,, ,, ,,
	7.0	,,	,, 5 ,, ,, ,,
,, 10th,	12.45	,,	No pains; general anæsthetic; bougie induction.
,, 12th,	7.0	,,	Onset of pains.
,, 14th,	1.30	,,	Normal delivery after a long labour assisted by pot. brom. and chloral, morphia and scopolamine, and pituitrin when the head was on the perineum.

CASE 2.—Multigravida, aged 25, expecting Sept. 15th, 1928.

July 20th,	3.0	P.M.	Inj. 5 c.cm. placental extract.
	7.0	,,	,, 5 ,, ,, ,,
	11.25	,,	Onset of pains.
	12.0	,,	Cervix admitted two fingers.
,, 22nd,	8.0	,,	Dilatation 2/6.
,, 23rd,	7.45	A.M.	Dilatation 5/.
	8.15	P.M.	Normal delivery, binovular twins, after morphia and scopolamine.

CASE 3.—Multigravida, aged 22, expecting May 12th, 1928. Induction for ? post-maturity and disproportion.

July 21st,	3.0	P.M.	Inj. 5 c.cm. placental extract.
	7.0	,,	,, 5 ,, ,, ,,
	11.0	,,	,, 5 ,, ,, ,,
,, 22nd,	3.45	A.M.	,, 5 ,, ,, ,,
	3.30	P.M.	,, 10 ,, ,, ,,
	7.30	,,	,, 10 ,, ,, ,,
	10.30	,,	,, 10 ,, ,, ,,
,, 23rd,	3.30	A.M.	,, 10 ,, ,, ,,
,, 25th,	12.30	P.M.	No pains; external cephalic version; bougie induction.
,, 26th,	4.50	,,	Onset of pains.
,, 28th,	5.20	A.M.	Normal delivery.

We came to the conclusion that very much larger doses of the material would have to be employed before definite results could be expected, and as at this time we heard that a more elaborate series of experiments was in progress elsewhere we decided to abandon this investigation.

Administration During Menopause.

A series of five cases was treated by daily injections of ten units of the hormone, and in all there was a marked improvement. It was found that the extract possessed definite powers of controlling the vasomotor and general symptoms of nervous irritability, but the number of cases was too few to produce anything definite.

General Conclusions.

These results do not at first sight indicate a very hopeful outlook for the use of this substance. Out of the 80 odd cases treated, only some 30 showed definite objective improvement, although practically all of them showed general improvement. The series was, however, too small to give an opinion upon, and at least a thousand cases of amenorrhœa must be treated before spontaneous recovery and other incidental factors can be excluded. Much larger doses of the substance must be given before it is put aside as useless. A large series of cases should be treated with 50 to 100 units per day, and with this very definite results might be obtained, and many hundred units in a single dose will have to be tried before a definite answer can be given. This applies more particularly to the attempts to produce premature labour.

We should like to enter an earnest plea that the material be given a really fair trial before being abandoned. The question of expense should not be allowed to deter experiments, while at the same time the very greatest care must be taken to avoid being misled by general effects, such as the patient "feeling much better." It is well known that all these results can be produced with many of the samples of commercial material that are being given to-day by mouth, but which in the laboratory have no demonstrable action.

Summary.

1. The results of treating 86 cases with an accurately standardised preparation of œstrin are described. The conditions investigated were amenorrhœa, menopause symptoms, and attempts to produce premature labour.

2. The cases of amenorrhœa were divided into two categories, according to whether the patient was married or not. Out of 32 unmarried women receiving full term of treatment menstruation was re-established in 10, whilst 18 married women out of 30 responded. It is noted that the response is considerably greater in married women than in unmarried.

3. Five cases of naturally occurring menopause were treated, and all showed definite abatement in vasomotor and nervous symptoms.

4. Two cases of surgical menopause following bilateral ovariectomy were treated with similar results.

5. Experiments intended to procure premature labour in three cases by the injection of some 300 units each were unsuccessful in two but successful in one. These results are obviously inconclusive.

6. Over 90 per cent. of the patients injected showed great improvement in general health and spirits, irrespective of whether menstruation was induced or not. Experiments with saline indicated that very similar results could be obtained, and therefore it was decided to discountenance these findings.

We wish to express our gratitude to Messrs. Boots Pure Drug Co., Ltd., for their generous financial assistance which has helped us to carry out these investigations.

We gladly acknowledge the coöperation of Mr. Comyns Berkeley, Mr. Victor Bonney, and Mr. L. Carnac Rivett in allowing us to investigate their cases. Mr. F. Roques kindly supplied us with case-histories and examined some of the patients.

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GENERAL ANÆSTHESIA

BY THE INTRAVENOUS INJECTION OF ETHYL ALCOHOL.

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SINCE June, 1929, a series of more than 40 operations has been performed with intravenous alcohol anæsthesia, using the method originally introduced into this country by Dr. Miguel Garcia Marin, of Mexico. With more data available, it is now possible to analyse the statements made in a previous article (THE LANCET, 1929, i., 1247) and, where necessary, to give the individual claims the benefit of personal observations.

The technique does not differ substantially from that previously described, but some slight modifications have been adopted, both in the solutions and the apparatus, for the convenience of the anæsthetist.

Preparation of the Patient.—It is of great importance for a successful anæsthesia that the patient should be in a perfectly quiet state of mind; and this, it has been found, can only be obtained by the administration of morphia hypodermically in doses of a quarter to half a grain, according to the nervous temperament of the case, not less than an hour beforehand. If it is given too soon the patient is sometimes inclined to be restless and talkative during the initial stages of induction, which is therefore prolonged and thus a greater amount of anæsthetic may be required. It is advantageous to give atropine as well, to counteract the depressing action of morphia on respiration. If careful attention is given to these preliminary recommendations, the induction is remarkably free from excitement as also, it has been observed, the stage of recovery.

Solutions.—The preparations required are: (*a*) an isotonic solution of glucose, which can be obtained in sealed ampoules of 300 c.cm.; and (*b*) rectified spirit (90 per cent.) which has been found just as efficient as the 96 per cent. ethyl alcohol originally suggested. The mixture of alcohol and glucose is now prepared in the following proportions: rectified spirit (90 per cent.), 40 parts; glucose solution (25 per cent.), 60 parts. This can be kept ready-made in amber-coloured bottles, as there is no alteration in either constituent of the mixture (there being no hydrolysis and the alcohol acting as a preservative). Naturally, the glucose solutions should be adequately sterilised, as for any other intravenous administration.

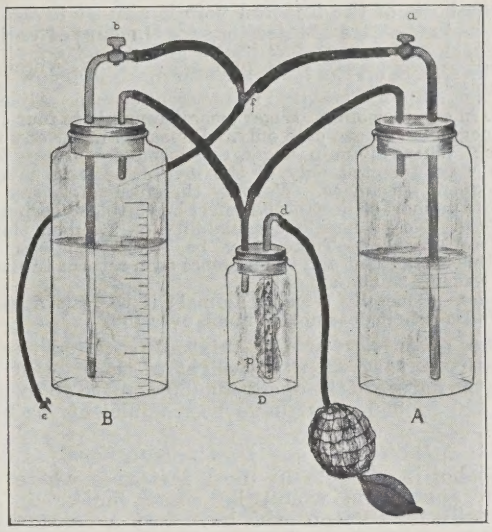
Apparatus and Administration.

For the majority of cases the gravity method was employed, but a more convenient arrangement has been devised. This apparatus works on the principle of the blood-transfusion flask. It consists of two bottles (A) and (B), each of 450 c.cm. capacity. (A) contains the isotonic solution of glucose and (B) the alcoholic mixture, (B) being graduated at 10 c.cm. levels. (D) is an air filter. The air inlet tube (d) is connected with the bellows and round its perforated end (p) a piece of sterile gauze is wrapped. The outlet tubes (a) and (b) have each a tap, and are joined by a Y-piece (f). To this is fixed a tube, having at its end an adapter (c), which will ultimately be fixed to the needle. All the bottles are capped with rubber stoppers through which are pushed the various metal tubes (as shown). The taps (a) and (b) are first shut, then pressure is introduced into (A) and (B); (c) is then opened and raised above the level of the bottles, the tap on bottle (B) is opened until fluid comes out at (c), and then both (b) and (c) are shut. Next the tap over bottle (A) and the tap at (c) are opened until all the air has been driven out of the outlet tubes. These taps are also shut, after the isotonic solution has flowed out at (c) for a few seconds. In this way it is made reasonably sure that the tube from (f) to (c) will contain isotonic solution only.

The apparatus is now ready for use. When the injection is about to be started, there must be sufficient pressure in the bottles, and tap (a) is opened. The vein is punctured with a needle in the usual way and, when blood flows freely, tap (c) is opened and connected with the needle, care being taken not to disturb the needle in doing so. When the isotonic solution is running freely, the needle is fixed with tape as described below. Tap (a) is turned off, and tap (b) immediately turned on. The rate of flow can be gauged by watching the level of the liquid in the bottle, and can be regulated by the outlet tap. Both taps must not be open at the same time, for fear of one liquid mixing with the other through regurgitation into either bottle via the Y connector (f). The whole of the apparatus (except the bellows) can be taken to pieces and sterilised by boiling. The bottles are fixed securely in clips on a suitable base, and the whole apparatus stands easily on any small table or anæsthetic trolley. It is advisable to use tall slender bottles (say about two and a quarter inches diameter), as the level of the liquid is seen to drop more rapidly than in bottles of a wider diameter.

It is important to stop injecting as soon as the level of either liquid reaches the lower extremity of the outlet tubes, or air will be injected, with detrimental results.

Anæsthesia.—The patient lies on the table with the eyes covered. The arm to be injected is abducted on to a suitable rest, with the forearm kept extended by an assistant



Apparatus used for administration of alcohol intravenously.

as long as the needle is in the vein. The needle, which should be of a sufficiently large bore and with a short bevel is then introduced into the vein in the usual way. When the blood flows, the adapter is connected to the needle, allowing the isotonic glucose solution (solution A) to run in, and then the needle and tube are secured to the skin with adhesive tape. The needle should be left alone and the arm continually held in the same position. When the flow is satisfactorily established with solution A, this is turned off and then the alcohol mixture is turned on. The rate of injection of the alcohol mixture should be roughly about 10 c.cm. in 30 seconds, but it has been observed that this rate may be exceeded to the extent of 20 c.cm. in 30 seconds with safety. At first the patient may complain of a dragging pain in the arm, but this soon passes off. It is important that the patient should not be allowed to talk or be disturbed in any way with questions. When anæsthesia is considered sufficiently deep, the alcohol mixture is turned off and the isotonic glucose is administered again. This procedure can be reversed as often as required, but one should always bear in mind the patient's allowance of alcohol. This is reckoned to be 2 to 3 c.cm. of 90 per cent. alcohol per kilo of body-weight. If the anæsthetist becomes uneasy about the condition, colour or breathing of the patient, he turns off the alcohol mixture and gives the isotonic glucose solution; this will quickly remedy matters. The breathing as a rule is very quiet, and sometimes tends to be shallow especially when the alcohol mixture is given too rapidly, but does not lead to cyanosis except when the air passages are mechanically obstructed; the isotonic glucose, however, never fails to act as a prompt stimulant. The rhythm of respiration remains perfect throughout, and the colour during and after the anæsthesia is exceptionally good. The induction may take 5 to 15 minutes or more.

At the beginning of the operation it may be helpful to administer a few drops of ether or chloroform on the open mask (and this can be done at any time during the operation),

if a sufficient amount of alcohol has not been given or if the surgeon requires a greater degree of relaxation. A few drops are sufficient. As a routine, the alcohol mixture is stopped after the incision and the isotonic glucose given to finish up, in quantities up to 500 c.cm. if necessary. When the needle is withdrawn a tight dressing is applied. It is to be noted that there is never laryngeal spasm.

Post-operative Care.

The patient usually continues to sleep for some hours, and should be watched with the same attention as after any other anæsthesia; but, when the reflexes return, he may be left for short periods. At the least sign of restlessness sufficient morphia should be given so that when the effects of morphia have disappeared those of the alcohol have already passed off and the recovery is not unpleasant. Vomiting has sometimes occurred, in spite of the original claims to the contrary, but has never been persistent, and has generally taken place whilst the patient was in a sort of "twilight sleep." Incontinence of urine has been noticed in many female cases but much less frequently in men. Thrombosis of the injected vein is almost invariable, but, as in the case of injections for the cure of varicose veins, should not give cause for any anxiety.

The effects on the body are summarised below :—

Urine.—Specific gravity : no apparent change. Albumin : trace in one case only. Sugar : small amounts in four cases. Hæmoglobin : in one case only. Deposits : never any renal casts. Where albumin, sugar, and hæmoglobin were found they were detected only in the first urine and never in subsequent specimens. We may therefore safely say that there is no marked destructive effect on the blood corpuscles.

Blood.—No change in coagulability or bleeding time.

Blood Pressure.—There may be a slight initial rise, but this is transient and the pressure soon returns to normal and remains so throughout.

Pulse.—Generally remains normal; if there is a rise in the pulse-rate it does not go much over 100.

The quantities of the mixture required for an anæsthesia vary with the weight of the patient and with the nature of the operation (60 c.cm. to 400 c.cm.), but 300 to 350 c.cm. have been sufficient for most cases.

Indications and Contra-indications.

Alcohol is suitable in most instances where any other anæsthetic would be contra-indicated, and especially for patients who have lost a considerable amount of blood or those suffering from shock in toxic cases; for old and debilitated patients; for compensated heart conditions where both the alcohol and the glucose act as cardiac stimulants; and where a mask would be cumbersome, as for operations on the head and face.

Children under ten years of age, owing to their susceptibility to alcohol and also to practical difficulties are unsuitable subjects. Advanced and active pulmonary tuberculosis and serious uncompensated heart failure are definite contra-indications.

The following are typical examples of cases in which alcohol anæsthesia could be used with advantage :—

CASE 1.—A married woman, aged 51, was admitted on account of severe bronchiectasis. As the level of the right side of the diaphragm was very high, a subdiaphragmatic abscess was suspected. The patient was much too ill for an inhalation anæsthesia and exploration was made under 60 c.cm. of intravenous alcohol-glucose with very satisfactory results. After a rib-resection nothing was found in the pleura or below the diaphragm, and the other side was explored with a trocar with the same result. The patient died next day, and autopsy showed both lungs riddled with abscesses; there was little lung substance left and the whole organ was markedly shrunk.

CASE 2.—A man, aged 50, weighing 15 st., was diagnosed as chronic cholecystitis and cholelithiasis. He had been intensely jaundiced for some months. Good muscular relaxation was obtained with 350 c.cm. of the mixture. Carcinoma of the gall-bladder, with metastases in the liver was found, and nothing radical was done. The patient was very comfortable on awakening, and had no vomiting. Death occurred a week afterwards.

CASE 3.—A married woman, aged 55, was diagnosed as acute intestinal obstruction. She had acute diffuse abdominal pain, with rigidity and free fluid. She was pulseless and in a moribund condition. Laparotomy was done under 250 c.cm. of the mixture and 500 c.cm. of isotonic glucose; the cause of obstruction was not found but the peritoneal cavity was drained. She stood the anæsthetic very well, and her pulse improved. She died next day and autopsy revealed a perforated gastric ulcer on the posterior aspect of the stomach. A special note was made about the condition of the lungs, which showed no evidence of œdema.

CASE 4.—A spinster, aged 25, had advanced Hodgkin's disease with large masses of glands, both cervical and mediastinal, the latter giving rise to pressure symptoms, such as stridor and dyspnœa, with cyanosis. It was decided to remove some of the cervical glands under a local anæsthetic but this was not satisfactory. A general anæsthesia was suggested but the ordinary inhalation methods were thought inadvisable under the circumstances, and intravenous alcohol was used instead, with excellent results. Although the patient was sick once or twice, she was not conscious of it, and awakened feeling perfectly fit.

CASE 5.—A man, aged 32, was operated on as an emergency on Oct. 10th, 1929, under chloroform-ether anæsthesia. He had a prolonged febrile temperature after the operation, with a fæcal fistula and a heavy purulent discharge from the wound. He was in a very toxic condition. A second operation was performed under alcohol anæsthesia on Nov. 26th for subdiaphragmatic abscess. Two large loculi of pus were found and drained. The patient stood the operation very well, was not shocked, and awakened in a better condition than before. As the temperature continued to rise, other abscesses were suspected, and another operation was performed on Dec. 4th, when more abscesses were drained. This time alcohol anæsthesia was again used with the same satisfactory results as before. On Jan. 7th the patient had a fourth operation. As the veins were collapsed and sclerosed from the previous injections and there was no time to dissect out a vein, open ether was used instead. The patient died from toxæmia ten days afterwards. In none of the many urine analyses made in this case was there found any sign of albumin, sugar, hæmoglobin, or renal casts.

CASE 6.—A sister, aged 55, was diagnosed as cancer of the left kidney. Before the anæsthetic, albumin, casts, blood, and pus were found in the urine from both kidneys, but no *B. coli*. Induction took ten minutes. Satisfactory anæsthesia was obtained with 300 c.cm. of mixture. Nephrectomy took one hour and twenty minutes, starting at 2.30 P.M. The patient slept until 8 P.M., when she showed signs of restlessness. A dose of morphia (gr. 1/6) was then given, and she woke up at 12 P.M. quite comfortable, with slight vomiting. There was no anuria. It was found necessary to give 12 drops of chloroform during the operation on four occasions, in doses of three drops at a time.

CASE 7.—A woman for partial thyroidectomy (Graves's disease). Induction free from excitement. Anæsthesia, perfect. No stridor. Surgeon expressed entire satisfaction. Recovery uneventful.

Advantages and Disadvantages.

When administered with all due precautions and proper technique, alcohol anæsthesia is a great help where other anæsthetics are contra-indicated. There is no risk of coagulation of the blood. The glucose, apart from its diuretic action, is of great value to counteract operative or anæsthetic shock. In fact, no signs of shock have yet been observed. It is not unreasonable to claim that it is a relatively safe anæsthetic. There is no case on record where death could have been directly attributed to this anæsthetic.

Difficulty may be experienced in finding a suitable vein for injection, but in a serious case it would be of very small consequence even if the vein had to be dissected out before the injection.

The induction has been known to take up to 20 minutes, but from experience it is fair to state that when the patient is properly prepared and all other precautions are taken, the period ought to be considerably less. For this reason alone the method may not win favour for routine work where there are several other cases to be dealt with in a limited time.

The relaxation of abdominal muscles is not invariably perfect and there is always hypervascularisation of the tissues. The nursing staff may raise objections because patients sometimes have incontinence of urine before they waken, and unless they are given morphia at the right moment they may be excited and noisy.

No doubt there is still room for improvement both in the technique and in the apparatus, and I am looking forward to the time when others publish favourable

reports on an anæsthetic which, in my opinion, may be recognised eventually as of considerable utility.

I have to thank Mr. Cairns Forsyth and Mr. R. M. Rowe, of the surgical staff of the French Hospital, for their courtesy in allowing me to use their cases: also Dr. Charles Dusseau, late resident medical officer of the hospital, for his care of the patients before and after the anæsthetics, for his practical assistance in more ways than one, and for his help in keeping the records necessary for the preparation of this article.

CHOLELITHIASIS AS A SEQUEL OF BLACKWATER FEVER.

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Relatively few reports of the post-mortem appearances in patients dying from blackwater fever have appeared, but the characteristic changes in the contents of the biliary passages have been recorded by different observers. Arkwright and Lepper [1] found the contents of the gall-bladder to be of such a consistency that they could be turned out as a solid mass. Dudgeon,[2] Yorke,[3] Thomson,[4] Stephens,[5] and Manson-Bahr [6] state that in fatal cases the gall-bladder is filled with dark green inspissated bile, while Whipple [7] describes this viscus as being typically distended with a dry curdy or finely granular dark greenish-black bile. Ross,[8] confirming the work of Kingsbury,[9] found an increased bilirubinæmia in 29 out of 30 patients with malignant malaria, the range being from below one unit of bilirubin up to 4·8 units in uncomplicated cases. Schachsuwarly[10] observed an increase in the serum bilirubin during and for some days after a malarial attack though in patients with latent malaria it was within normal limits. In 21 patients with blackwater fever Ross found amounts of bilirubin in the serum ranging from just over five units in a specimen 24 hours old to 59 units in a patient dying with suppression of urine. Unless anuria supervened, the reaction to the van den Bergh test was always an indirect one.

The hæmoglobin liberated during an attack of blackwater fever is either excreted by the kidneys or is converted into bilirubin, which is dealt with as far as possible by the liver. Yorke and Nauss,[11] found that only one-fifth or less of the hæmoglobin injected intravenously into normal rabbits was excreted in the urine. When anuria results, Ross [8] suggests that possibly obstruction of the whole biliary system may sometimes supervene, leading to a complete cessation of excretion of the liberated hæmoglobin and its products.

In malignant malaria the hæmolysis is apparently not of sufficient intensity to lead to the formation of pigment stones in the biliary passages, otherwise they would have been found frequently in the numerous post-mortem examinations performed on patients who have suffered from this disease. On the other hand, the findings detailed above show that in severe attacks of blackwater fever conditions are exceedingly favourable for the production of such calculi in the biliary passages, and it is remarkable that no report of the occurrence of biliary pigment stones following blackwater fever could be found in the literature. In the patient whose history is recorded below, a tentative diagnosis of a pigment calculus was made before operation, as it was considered that such an occurrence should be at least as likely a sequel of blackwater fever as of acholuric jaundice (familial or acquired hæmolytic splenomegaly), in which, according to Piney,[12] pigment calculi are almost invariably present in all patients who live to a fair age.

A Case Related.

The history illustrates the occurrence of a subacute cholecystitis in a patient with a large biliary pigment calculus, formed presumably as a result of previous attacks of blackwater fever.

A single male, aged 34 years, was first seen on Oct. 4th, 1929, by the courtesy of Dr. E. W. Sutcliffe. The patient had been in New Guinea from 1920 onwards, and within two months of his arrival there he had a continuous fever for a fortnight as the result of an infection with *Plasmodium falciparum*. In 1922 he was ill for a month with another attack of malignant malaria. Thereafter he usually took a daily dose of a quinine salt as a prophylactic measure. However, in 1923 and again in 1926, after he had omitted to take the quinine on each occasion for some weeks, he developed blackwater fever. In 1923 and in 1926 he also suffered from attacks of dysentery, probably of bacillary type. Though some ten pounds below his former weight, he remained for the next three years in apparently perfect health, indulging in strenuous labour on the New Guinea gold-fields before the advent of the Air Service there.

In July, 1929, he was admitted to hospital with the diagnosis of pleurisy and pneumonia, the chief symptoms being a stabbing pain beneath the right scapula increased by deep breathing, a severe pain in the right hypochondrium and in the right umbilical region, greatly aggravated on coughing, and a cough with some pinkish and also some rusty sputum. After nearly eight weeks he sailed for Victoria, but on the third day out from Rabaul he was seized with a severe constant pain in the right umbilical region, radiating through to the back, accompanied by fever and anorexia. The administration of quinine, aspirin, and an unknown mixture was followed within 24 hours by a generalised itchy rash, so all drugs except quinine were stopped. There was no jaundice and vomiting occurred only once. By the middle of September he was apparently well, though he had lost 16 pounds in weight during his illness.

On Sept. 30th, he was again suddenly seized with a constant aching pain about the umbilicus, radiating through to the midline of the back about the level of the twelfth thoracic vertebra. The pain was exactly similar to that which had troubled him on the journey home. Nausea developed and was soon followed by vomiting, while regurgitation of sour fluid and gas into the mouth was troublesome. There was no rigor but chilly feelings were persistent. Within 24 hours of the onset of symptoms jaundice was noted, while the dark colour of the urine had been observed a few hours previously. The temperature at this time was 103·8° F. On Oct. 2nd the patient was admitted to hospital, and soon afterwards a mild rigor occurred. A slight degree of fever was present next day and grs. 15 of quinine bihydrochloride were taken, with subjective improvement. The patient came under observation on Oct. 4th. He had never previously suffered from indigestion or flatulence. There was no trouble with micturition, the bowels were regular, and there was no history of venereal disease nor of any over-indulgence in alcohol.

Examination revealed definite jaundice of the conjunctivæ and skin, while the remains of a diffuse dermatitis—probably the result of the ingestion of some drug—were visible. The temperature was 98° F., the pulse-rate being 60 per minute. No abnormality was detected in the heart or the lungs. On deep inspiration the spleen was palpable two fingers-breadths below the rib margin but was not tender. The liver edge could be felt at the costal margin, and there was a localised point of considerable tenderness immediately below the ninth right costal cartilage. The urine contained a trace of albumin and much bile-pigment, but no sugar, no urobilin, and no hæmoglobin. Microscopic examination revealed the presence of bile-stained calcium oxalate and uric acid crystals. The stools were clay-coloured. The hæmoglobin estimation (Sahli) was 90 per cent.; the red cells numbered 4,500,000 per cubic millimetre, and were apparently normal in the films, which on two separate occasions failed to reveal any malarial parasites. The differential leucocyte count showed 12 per cent. of eosinophile cells, 50 per cent. of polymorphonuclear neutrophile cells, 4 per cent. of basophile cells, 30 per cent. of lymphocytes, and 4 per cent. of large mononuclear and transitional cells. No reaction followed the intradermal injection of hydatid fluid for the Casoni test, nor was any reaction obtained with complement-fixation tests for hydatid disease and syphilis. The patient was given grs. 20 of quinine bihydrochloride daily by mouth.

On Oct. 9th the general condition was apparently unaltered, but a small tender mass could now be felt in the region of the gall-bladder. No malarial parasites were found in the blood films. The leucocytes numbered 6500 per cubic millimetre, while a differential count showed 12 per cent. of eosinophile cells, 55 per cent. of polymorphonuclear

neutrophile cells, 1 per cent. of basophile cells, 28 per cent. of lymphocytes, and 4 per cent. of large mononuclear and transitional cells. Microscopic examination of the stools revealed the presence of soaps but no neutral fats and no parasites. A very occasional structure was stained with bile-pigments, and chemical tests revealed the presence of bile-salts and stercobilin. There were ten units of diastase in the urine and 36 mg. of urea per 100 c.cm. of blood. The blood-serum yielded a biphasic van den Bergh reaction, the colour appearing in ten seconds and deepening for some minutes.

By Oct. 13th the patient had been afebrile for four days and the jaundice was less intense, but in the next five days the temperature rose every 44 to 48 hours to 100° F. and on the alternate days to 99·2° F. At midday on Oct. 18th a rigor occurred. The red cell count and hæmoglobin percentage were unaltered but the leucocytes now numbered 9000 per c.mm. No malarial parasites were seen and the physical signs were unchanged. The dose of quinine was reduced to grs. 10 daily and in preparation for operation 15 units of insulin with 30 g. of glucose were given daily. Calcium chloride in doses of 5 c.cm. of a 5 per cent. solution was also given intravenously. By Oct. 24th the temperature had been within normal limits for four days and the jaundice was decreasing. Mr. Cedric Roche opened the abdomen and found a subacutely inflamed gall-bladder with thickened walls densely adherent to the bowel. The gall-bladder was drained after removing a large oval calculus, measuring 5 × 2·5 cm., which completely filled the gall-bladder. The calculus in bulk was black in colour, though when smeared on white paper it left a brown stain, while the smallest particles broken off had a reddish tinge. The superficial parts of the calculus were friable and on firm pressure the stone was easily fractured. There was no obvious nucleus and microscopic examination showed the mass to be amorphous. Analysis proved the calculus to be composed practically entirely of bilirubin with some calcium bilirubinate, though traces of cholesterol were detected chemically. No bile-salts were found.

A week after operation the fragility of the patient's red blood corpuscles to hypotonic saline solutions was tested. In the control, hæmolysis commenced in 0·45 per cent. and was complete in 0·35 per cent. saline solution. With the patient's corpuscles, hæmolysis commenced in 0·40 per cent. and was complete in 0·30 per cent. saline solution. There was thus definite evidence of increased resistance of the red cells to hypotonic saline solutions, exactly the reverse condition to that found in acholuric jaundice. A reticulocyte count a fortnight after operation showed only 0·1 per cent. of reticulocytes in the blood films. In acholuric jaundice the reticulocyte count is usually greatly increased. On Nov. 7th the jaundice had disappeared, the stools were of normal colour, the patient had made an uninterrupted recovery, the wound was almost healed, and the spleen was no longer palpable. No quinine had been taken since the operation. There was occasionally a little burning urethral pain on micturition, and microscopic examination of the urine showed calcium oxalate crystals, a few pus cells, and granular and hyaline casts.

The patient remained in excellent health for the next seven weeks, putting on 22 pounds in weight. On Dec. 26th, after exposure to a cold wind, he had a shiver and later vomited. Within the next two days an obstructive jaundice developed, with dark urine and clay-coloured stools. On Dec. 29th he was seen by Dr. I. H. Cowling, who has kindly supplied the following notes. Examination showed obvious jaundice. The temperature was 101° F., the pulse-rate being 90. The tongue was dirty and there was tenderness over the old wound, in the centre of which there was a stitch abscess from which a catgut knot was extracted. Calomel was given in divided doses, and also a mixture containing sodium salicylate, sodium bicarbonate, and sodium benzoate. Next day the temperature was normal and remained so for the next ten days, during which time the tenderness disappeared and the jaundice diminished slightly. In the next three weeks, however, the jaundice became progressively worse, while sleep was almost impossible because of the intense intractable pruritus.

On Jan. 28th, 1930, the patient again came under observation. He stated that for the previous week the temperature at 6 P.M. had never been below 100° F. and that on the day before it had reached 102·5° F. Constipation was very troublesome, and latterly there had been some irritation on passing urine. The jaundice was increasing in intensity and the pruritus was unbearable. Examination showed that the breath sounds were rather diminished at the base of the right lung, the liver edge was just palpable at the costal margin, and the spleen could be felt on deep inspiration about two fingers-breadths below the costal margin. There was no tenderness anywhere in the abdomen.

After preliminary treatment with glucose, insulin, and calcium chloride, Mr. Roche explored the abdomen on Jan. 30th, 1930. Two pigment stones, each about the size of a cherry, were removed from low down in the common bile-duct, which was dilated behind the obstruction, its diameter being about half an inch. White bile was present in the duct, which was drained. The walls of the gall-bladder were thickened but the viscus was not dilated. A cholecystectomy was performed. Microscopic examination of the gall-bladder showed the presence of a chronic cholecystitis. Dr. R. Wright-Smith reported that the epithelium was intact and showed no increase in fat content. The submucosa was infiltrated with lymphocytes and large mononuclear and plasma cells, and contained numerous dilated capillaries. The muscle and serous coats were thickened and were infiltrated with lymphocytes and large mononuclear cells. All coats showed evidence of fibrosis, both mature and young fibroblasts being present. A fairly large collection of fat was observed in the subserous tissue. Analysis of the calculi showed that a thin outer crust of the stones was composed of cholesterol while the remainder consisted of bilirubin with a small amount of calcium bilirubinate.

Discussion.

The only disease in which biliary pigment calculi are commonly found is acholuric jaundice. In the case reported here the increased resistance of the red blood corpuscles to hypotonic saline solutions and the low reticulocyte count are sufficient to exclude this disease.

It is realised that one example of the occurrence of a biliary pigment calculus in a patient who had previously suffered from blackwater fever by no means proves the ætiological relationship of this fever to the formation of the calculus. However, on theoretical grounds it seems probable that such calculi should be not uncommon sequelæ in patients who recover from a severe attack of blackwater fever. Evidence in favour of this is found in the results of the van den Bergh test in such patients and still more so from the results of post-mortem examinations in those dying from this disease.

In Victoria the opportunity of examining a patient who has suffered from blackwater fever rarely arises, and the object of this paper is to direct attention to a possibly not uncommon sequel of the disease in the hope that others with greater opportunities will be able to prove or disprove the views recorded here. Routine examination by cholecystography of patients who have in the past suffered from blackwater fever would give valuable evidence of the presence or absence of gall-stones. That such stones were pigment calculi would have to be determined after operation or post-mortem examination, though the fact that clinically these calculi were latent and failed to give rise to the usual symptoms of flatulent dyspepsia—so common in the ordinary case of gall-stones arising as a result of infection of the gall-bladder—would be evidence in favour of their metabolic origin. Should such calculi prove not uncommon sequelæ of blackwater fever, appropriate treatment directed to flushing of the biliary passages might be valuable as a prophylactic measure.

Pigment gall-stones seem likely to occur as sequelæ in other forms of hæmoglobinuria, more particularly as a result of the recurrent attacks of paroxysmal hæmoglobinuria.

I am indebted to Miss B. Splatt, who analysed the biliary calculi, and to Dr. R. Wright-Smith, who reported on the histological appearances of the gall-bladder.

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THE VERNES RESORCIN TEST AND TUBERCULOSIS.

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THE clinical diagnosis of tuberculosis is frequently uncertain, and the presence of the tubercle bacillus cannot always be demonstrated. Attempts have therefore been made from time to time to introduce a reaction which is specific for tuberculosis, but until recently no test has been elaborated which can be utilised with any degree of success as a measure of the progress of a case of tuberculosis. It is now possible, by means of the Vernes resorcin test and by estimation of the sedimentation rate of the red cells, to determine the progress of the majority of cases by laboratory procedures, but neither of these tests is specific for tuberculosis.

In 1928 Dr. Arthur Vernes, of L'Institut Prophylactique, Paris, published "Études sur la Sérologie de la Tuberculose," which dealt fully with the resorcin test, and analysed the results of the examination of 1240 persons, including 184 normal individuals. The question of tuberculosis does not arise in a perfectly fit person, and a test can only be of value when it is capable of differentiating obscure cases of tuberculosis from other conditions in which no definite clinical diagnosis is possible. Vernes gave no particulars of these 184 cases, and it was obvious that it would be helpful if a series of tests were performed on the blood of patients suffering from other diseases than tuberculosis. This was the original object of our research.

Technique of the Resorcin Test.

In a chemically clean test-tube is placed 0·6 c.cm. of serum; to this is slowly added 0·6 c.cm. of 1·25 per cent. solution of resorcin in doubly-distilled water, and the optic density of the resultant mixture is immediately determined in the Vernes-Bricq-Yvon photometer. This photometer simplifies the determination of optic density and is exceedingly accurate and simple in use. The optic density should be measured with the least possible delay, as it increases very rapidly in those bloods in which a high reading will eventually be obtained. It is advisable to carry out the test on another 0·6 c.cm. of the same serum to serve as a control. If the reading obtained in the control varies by more than 3 per cent. the results cannot be relied on. The mixture is allowed to stand at room temperature for four hours and the optic density is again determined. The difference between the second and the first reading is the photometric figure for the test.

Vernes states that a figure below 15 is given, as a rule, when a person is not affected by tuberculosis, whilst the probability of the existence of tuberculosis becomes greater as 30 is approached. He said in 1927:—

> "Except in a small number of cases, which can be easily recognised, a person may be considered to be affected with active tuberculosis when the reading is above 30, and if a thorough examination reveals nothing wrong with the lungs, tuberculosis will be found elsewhere."

The cases to which Vernes refers are: "syphilis, during the period of the chancre only, soft chancre, lung disease (pneumopathie) with high fever, violent septicæmia, and certain cases of cancer in an advanced stage." As a result of these statements, it seemed that a valuable test had been evolved for the certain diagnosis of tuberculosis, whilst further experimental work showed that the optic density of the serum with resorcin was directly proportional to the degree of activity of the disease.

The Test not Specific for Tuberculosis.

During the last 12 months an investigation as to the value of this test, both in diagnosis and prognosis, has been carried out in the Biochemical Department of the Clinical Research Association. 350 sera have been examined, 200 of which were obtained from hospital or sanatorium cases of proved tuberculosis, while 150 were from persons suffering from disease other than tuberculosis. In addition to these, 25 sera from normal individuals were examined. From our results it seems reasonably certain that, when an optic density below 40 is obtained, active tuberculosis can be definitely excluded, but the opposite does not apply, and a high figure is obtained in all pyrexial conditions, particularly where there is any tissue destruction, especially in bone and joint disease (osteomyelitis, arthritis, rheumatic fever). Several of these cases showed figures exceeding 90, whilst one case of rheumatoid arthritis in an old lady with no clinical or X ray evidence of tuberculosis gave a figure as high as 158. As the condition of the patient improved, so did the density figure drop as in the phthisis cases. The average figure for acute cases was 95, while in convalescence a figure of between 40 and 50 was obtained.

Another group of cases investigated was typhoid fever. An average figure of 55 was obtained in the second and third week of the infection; this test does not, therefore, differentiate between typhoid in the second week and abdominal tuberculosis. Advanced malignant disease usually produced a figure of over 100. Cases of furunculosis and carbuncle gave an average figure of 55, whilst one case of carbuncle gave a reading as high as 269.

The normal individuals tested were all apparently perfectly healthy, and the figures obtained were below 15 with one exception. This case, after giving an index of 1, was retested after an interval of one month whilst suffering from a common cold. The figure then obtained was 77. After a further interval of one month, when complete recovery had taken place, a figure of 2 was obtained. Another case of special interest came under our notice of a patient suffering from asthma, in whom no trace of recent or active tuberculosis could be found either clinically or radiographically. Two Vernes resorcin tests were performed, one during an asthmatical attack, which gave an index of 50, the other under normal conditions when a figure of 28 was obtained. The interval between the tests was seven days. The question was raised: did the positive Vernes figure in the first instance indicate the lighting up of an old tuberculous lesion, or did it merely indicate a pulmonary activity of the bronchial asthmatical type? If the former, then the activity subsided within seven days, and—from our knowledge of activity in tuberculosis—not only is this very rapid but also highly improbable. No such rapid drop in the index was observed in the most favourable case of phthisis. It seems true, therefore, that perfectly fit persons with no disease whatsoever will generally give a figure below 15, but this application of the test would only be of value to an employer of labour who wished to safeguard himself from engaging a person with active tuberculosis.

A few cases of surgical tuberculosis were also tested; these included joint disease, tuberculous peritonitis, and renal tuberculosis. All the cases of active tuberculosis gave figures exceeding 40. An average figure of 103 was obtained, whilst five cases gave readings above 150, the highest recorded being 198. These high readings are of interest in view of Vernes's statement that a figure of 150 was rarely exceeded in tuberculosis. Several serial tests were performed and as activity diminished so also did the figure for the optic density with resorcin. The average figure of 28 was obtained for inactive cases, whilst six sera from patients with tubercle bacilli in the sputum gave figures below 15, varying between 4 and 13. These cases were all inactive, but nevertheless tubercle bacilli persisted in their sputa. It is

evident, therefore, that the test is of no practical value in inactive tuberculosis.

Sufficient evidence has been obtained for us to state quite definitely that the test cannot be regarded in any way as specific for tuberculosis. In the really doubtful cases a high index does not necessarily indicate a tuberculous lesion. Even advocates of the test such as Goiffon and Pretet and André Bréton do not consider the test to be absolutely diagnostic, and quote several exceptions.

The chief diagnostic value of the test appears to lie in a negative result for the exclusion of active tuberculosis. The Pirquet and Calmette reactions are also valuable in a negative direction, but they do not possess the same value as the Vernes test in that they do not give a numerical idea of the activity when tuberculosis is known to exist.

The Test as a Numerical Index of Progress.

It was at once obvious to us that the most active cases gave the highest readings, and as improvement occurred the index fell. Other cases show no fall or give an increasing index; these are the cases that are obviously going downhill. A typical case which is not responding to treatment gives indices at monthly intervals as follows:—

100	112	110	105	100	130

whilst a favourable case shows:—

80	72	63	53	41	31

Although secondary peaks may occur, corresponding with exacerbations, the general trend of the curve gives an excellent idea of progress, and often exactly reflects the radiological and clinical findings. The index gives information of the imminence of an exacerbation in advance of the thermometer and the general condition of the patient. Certain patients who are apparently responding to treatment but in whom no reduction of the index has taken place have, in our series, ultimately failed to benefit by treatment and the gradual trend has been downhill.

Comparison with the Erythrocyte Sedimentation Test.

These features also appear in the erythrocyte sedimentation test, and we therefore decided to make a comparison of the results of the two tests. A comparison was made in 130 cases of pulmonary tuberculosis, doubtful cases, and normal persons. The bloods for each test were taken at the same time and under the same conditions. Of these 130 cases, we found practical agreement in 90 per cent., not only in the interpretation of the numerical values for both tests, but also in the clinical and X ray findings.

The particular technique employed for the sedimentation test is as follows: 3 c.cm. of blood are withdrawn by venepuncture and mixed with 1 c.cm. of a 3·8 per cent. solution of sodium citrate; 2 c.cm. of this mixture are drawn up into a pipette of 4 mm. calibre and graduated in 0·1 c.cm. from zero to 2 c.cm. with intervening divisions of 5 between each 0·1 c.cm. There are, therefore, 100 divisions in 2 c.cm., and the rates of fall can be reckoned as percentages.

The readings observed after two hours were recorded and these figures have been plotted as a graph, with the figures for the optic index of the serum with resorcin as one of the ordinates, and the percentage rate of fall of the erythrocytes as the other. This graph clearly shows how close this agreement is in the last 28 of our cases. It was not considered advisable to compare the results of all the sera, because there had been, on some occasions, undue delay in performing the resorcin test. André Bréton pointed out that the test should be carried out within 24 hours of the drawing of the blood, so when this particular comparison was carried out a standard time of 20 hours was allowed to elapse before the Vernes test was commenced, thus ensuring that the same conditions obtained in all cases. It was found that the erythrocyte sedimentation rate behaved in exactly the same manner as the resorcin test, and either test gave a very valuable indication of the progress of any particular case. Although the products of the results are not within the range of an absolutely straight line, they are within the limits of experimental error, and by means of the graph an approximate figure for the optic density of a serum may be arrived at from the result of the sedimentation test.

Fahraëus observed that the sedimentation rate was increased not only in tuberculosis, but also in all kinds of infection, most distinctly when accompanied by high fever, and in many cases of malignant tumours and certain forms of psychosis. We have ourselves shown that such conditions also produce an increase in the resorcin figure, while we have

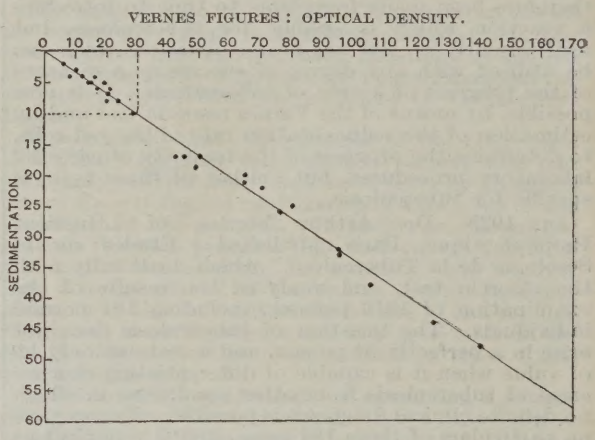

Chart showing relationship between the Vernes resorcin test and the sedimentation test (2 hourly reading of the rate of fall) The dotted line indicates the limits of normality in each test.

further demonstrated that bone and joint disease produce a most decided increase in this test with a correspondingly diminished blood stability. The agreement also occurs even in such temporary states as coryza. Whenever there is pyrexia, particularly in association with tissue destruction, an increase in the Vernes figure and a more rapid sedimentation of the red cells will result. The natural corollary to this close agreement of the two tests appeared to be that the same factors produced both these phenomena, while it is abundantly clear that no specific body is present in the serum of a tuberculous individual which will produce an increased optical density with resorcin, and it is equally certain that there is no such substance causing a more rapid sedimentation of the erythrocytes. Sedimentation is undoubtedly due to the action of hæmagglutinins. These are in turn probably dependent on the presence of proteins in the plasma. Sedimentation occurs very rapidly in pure fibrinogen, less rapidly with globulin, and very slightly in solutions of albumin. A reduction in the suspension-stability of blood is brought about by an increase in the fibrinogen or globulin protein fractions. Breaking down of tissue proteins with the undoubted increase in the globulin fraction of the serum proteins in these conditions may, therefore, account for the increased sedimentation rate of the erythrocytes. The increase of fibrinogen alone does not appear to account for the raised optical density with resorcin, as serum after clotting is used in this test.

The Colloidal Dispersion of the Globulin Fraction.

If it is conceded that the diminished stability of the blood and the increased optical density with resorcin are due to a common factor, it appeared to us that this must be sought in a variation of the globulin fraction of the serum. With this object in

view a series of determinations of the total protein, the total globulin, and the Vernes index were performed on 22 different sera. For the sake of simplicity the globulin and total protein figures for the sera were estimated photometrically, and the results shown in the following Table were obtained.

A = Optic density. C = Percentage albumin.
B = Percentage globulin. D = Total protein globulin × 100.

A.	B.	C.	D.	A.	B.	C.	D.	A.	B.	C.	D.
7·5	3·3	7·3	45·8	51	3·7	8·2	44·9	125	3·9	4·4	88·7
16	2·66	7·8	34·1	64	4·7	8·5	55·3	125	4·3	8·0	53·5
17	2·7	8·8	30·7	66	4·0	8·8	45·5	134	5·0	6·4	77·8
17	3·72	8·6	43·3	71	4·0	6·5	60·9	134	4·2	6·0	70·0
21	2·8	8·2	34·2	77	3·8	7·4	51·8	191	4·2	5·6	74·4
24	3·7	8·6	43·5	81	5·2	7·4	69·8	165	4·6	7·6	60·3
31	3·1	8·4	36·9	94	4·6	8·8	52·3				
34	3·0	9.0	33·8	113	4·7	7·6	61·8				

Obviously the Vernes resorcin test is neither dependent on the percentage of globulin in the serum nor on the proportion of globulin to total protein. The most that can be said is that there is a general trend for the globulin to increase as the optical indices do. The high figures were obtained in cases of active phthisis. Sera denuded of globulin by saturation with magnesium sulphate gave no increase of density with resorcin, whilst artificial increases of the optical indices in normal sera were obtained by the addition of globulin. An attempt was also made to correlate the findings with the various fractions of globulins, such as euglobin and pseudoglobulin 1 and pseudoglobulin 2, but no definite relationship could be demonstrated. It seems, therefore, that the important factor is not so much the actual quantity of globulin present in the serum, or its proportion to the total protein as its colloidal dispersion. With an increase of globulin, the particles of which are larger than those of albumin, the circulating blood plasma is less dispersed. This was pointed out in 1927 by J. Daranyi in comparing the value of the physical colloidal chemical investigations of the blood with the "immune-diagnostic" methods in the diagnosis of tuberculosis.

With the decrease of the dispersion the flocculation of the serum by various physical agents is augmented, or the colloidal lability becomes greater. After several comparative examinations with different physical agents, Daránvi arrived at the conclusion that the method of colloid lability is best combined with that of refraction—the latter giving approximately the protein content. From the refraction the quantity and from the colloid lability the dispersion of the serum is estimated, both these values expressing the protein structure. In incipient cases refraction is normal and colloid lability in most cases, if not strong, is at least positive. In chronic cases both values are increased. In grave cases there is low refraction with very strong colloid lability. In serial examinations the increase of refraction and colloid lability indicate a progressive tuberculous disease and a decrease of both indicates healing. This is precisely what can be demonstrated both with the resorcin test and by means of the sedimentation rate of the red cells.

During the course of this work an attempt was made to apply the test to the blood of cattle. Blood from both normal and tuberculous cows was obtained, but no results of diagnostic value can be recorded; indeed, some of the optical indices obtained from the infected animals were actually lower than the figures for the sera of normal animals. This is probably explained by the fact that there is a decrease in the globulin content of the plasma of cattle suffering from tuberculosis. No reliable results could be obtained on the sera of laboratory animals which had been inoculated with tuberculous material, and we were unable to confirm the statements of certain of Vernes's collaborators that the test could be usefully employed to expedite the diagnosis of tuberculosis by the withdrawal of blood after 14 days from the experimentally infected animal.

With a view to further investigating the possibility of an increase in globulin affecting the optical index of fluids when mixed with resorcin, 100 consecutive specimens of cerebro-spinal fluid were examined and positive results were obtained in cases of tuberculous meningitis by applying the slightly different technique described by Vernes to the fluid itself. If a comparison with normal fluids be made, perfectly satisfactory results are obtained, but it is not possible to differentiate a tuberculous meningitis from any other meningeal infection by this means. In all cases where a globulin increase occurred a raised optical index was recorded. As in the case of the blood, the chief value of the test appears to be in a negative result. It seems that, in cases of suspected tuberculous meningitis where it is not possible to demonstrate the presence of the tubercle bacillus, an increase of globulin accompanied by a decrease in the chloride content and the amount of reducing-body present, together with a slight lymphocytosis, are better presumptive evidence of tuberculous meningitis than a raised optic density of the fluid with resorcin.

In conclusion, we should like to mention our very great indebtedness to Dr. E. Ofenheim, of St. John's Hospital, Lewisham, who introduced the Vernes syphilimetric test and the resorcin test to this country and who has been so kind as to demonstrate the technique and explain the intricacies of the special photometer employed. It is only through his great interest in the matter that we undertook this investigation. We should also like to thank Dr. W. C. Fowler, superintendent of Pinewood Sanatorium, for sanction to carry out this work and for his valuable help and suggestions; Dr. J. C. Muir, medical superintendent of Whipps Cross Hospital, for supplying blood specimens from several cases of tuberculosis, and from patients suffering from diseases other than tuberculosis, also for his copious notes on the cases; and Mr. R. J. Parris for much of the technical work which he has most skilfully carried out.

Conclusions.

1. The Vernes test cannot be considered specific for tuberculosis. 2. Its chief value in diagnosis is that a figure below 30 contra-indicates active tuberculosis; the converse does not obtain. 3. The results are very valuable in prognosis and as a guide to treatment. 4. A persistently high figure, despite apparent clinical improvement and diminished activity, indicates an unfavourable prognosis, whilst a low figure accompanying an active condition permits of a more hopeful outlook. 5. Exacerbations and the return of activity are foreshadowed by a raising of the index before any change in the general condition of the patient or in the temperature chart are observed. 6. The test has no value in the diagnosis of tuberculosis in animals. 7. There is close agreement between the Vernes resorcin test and the suspension stability test (sedimentation rate of the red cells), and both probably depend on the altered colloid lability of the blood in tuberculosis.

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Clinical and Laboratory Notes.

PRIMARY CARCINOMA OF LIVER IN A CASE OF HÆMOCHROMATOSIS.

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In the recorded cases of that comparatively rare condition, hæmochromatosis, cirrhosis of the liver appears to be a constant post-mortem finding. The association between multilobular (so-called alcoholic) cirrhosis of the liver and primary carcinoma of the liver has been demonstrated many times. The following case, in which all three conditions coexisted, seems to be of sufficient interest to record.

The patient, an engineer, aged 54, was admitted to St. Mary's Hospital on Dec. 24th, 1929, suffering from pain in the back, chest, and shoulders. This pain had started six weeks previously and had been continuous; the patient had collapsed several times. Flatulence and constipation were prominent symptoms. There was nothing of importance in the previous history apart from "indigestion" three years before, consisting of pain across the chest after meals; this had been relieved by medical treatment.

Condition on admission.—The temperature was 99° F., the pulse-rate 80, and the respiration-rate 20. The facial expression was rather anxious, the lips and ears showed marked cyanosis, and there was considerable dyspnœa; the teeth were bad, and the tongue furred. The abdomen was distended; the liver edge was palpable two inches below the right costal margin, but the spleen and kidneys were not palpated. There was no evidence of fluid in the peritoneal cavity. The chest showed some flattening of the right supraclavicular region and slight impairment of movement and percussion note on the right side, with harsh breath sounds in the right axilla; X ray examination on Jan. 9th, 1930, suggested old chronic tuberculous foci in both lungs, with a more recent lesion at the right apex. The cardiovascular and nervous systems were normal. Urine examination showed a specific gravity of 1030, an acid reaction, and no abnormal constituents.

On Jan. 14th there was some increase in the abdominal distension, with evidence of fluid and the bowels were still very constipated. Weakness in the legs developed, especially on the left side, with loss of the knee, ankle, and abdominal reflexes; later the patient had to be catheterised. By Jan. 27th he was in a semi-comatose state, still very cyanosed, and showed marked abdominal distension and ascites. The temperature rose rapidly during the last day (Jan. 28th: 97°; Jan. 29th: 6 A.M. 102°; 10 A.M. 104·5°; 2 P.M. 106·8°; 5 P.M. 108·2°), and he died at 6.50 P.M.

Necropsy.

No bronzing of the skin was observed, with the exception of some slight pigmentation of the legs. The abdomen contained about 40 oz. of clear, straw-coloured fluid. The liver was enlarged and weighed 2700 g.; it was reddish-brown in colour and showed the typical coarsely granular surface of cirrhosis over most of the right lobe. Areas of greyish-white tissue were seen in the left lobe (up to 10 × 4 cm.), and smaller and much more scattered foci (up to 2·5 cm. in diameter) of similar tissue were present in the right lobe. On section, these parts were of soft consistency, in contrast with the rest of the liver which offered a considerable resistance to the knife. The largest pale areas showed some central softening, and appeared to be formed by the confluence of smaller nodules. When placed in a mixture of potassium ferrocyanide and hydrochloric acid, the reddish-brown cirrhotic portions of the liver developed an intense blue colour, indicating the presence of free iron in considerable amount, whilst no reaction was obtained in the greyish-white zones. The pancreas and abdominal lymph glands were also reddish-brown and gave a strongly positive Prussian-blue reaction. The spleen was enlarged, congested, and tough, with an increase of fibrous tissue; no iron was demonstrated macroscopically. The kidneys were slightly congested, and did not react for iron. No changes of importance were found in the alimentary canal.

Pleural adhesions were present over the apices and diaphragmatic surfaces of both lungs, and on both visceral pleuræ were numerous small grey nodules (3 mm. in average diameter). At the apex of the right lung was a large pigmented scar, evidently an old tuberculous lesion; there was slight hypostatic broncho-pneumonia of the left lower lobe, and acid digestion of both lungs. The heart showed subpericardial petechiæ, parenchymatous degeneration of the myocardium, and a patch of subendocardial hæmorrhage on the left side of the interventricular septum. The arteries showed a moderate amount of atheroma. The brain and all other organs were normal. The degree of post-mortem decomposition of all organs was much greater than would be expected in winter 20 hours after death.

Histology.

Liver.—The reddish-brown tissue shows the histology typical of hæmochromatosis; the picture is that of multilobular cirrhosis, together with a heavy deposition of hæmosiderin pigment. Granules of hæmosiderin are present in the parenchyma cells and Küpffer's cells of the adult liver tissue, in the fibrous tissue, and in the cells of the regeneration nodules. The greyish-white tissue is a solid alveolar, polygonal-celled carcinoma, having the histological characteristics of a liver-celled carcinoma. No pigment is present in any of the essential cells of the tumour nodules, though it can be found in the cells of the stroma, even in the central parts of the largest deposits of growth. In sections stained for iron with a mixture of potassium ferrocyanide, potassium ferricyanide and hydrochloric acid, and counterstained with lithium carmine, the growth can be differentiated with ease from the cirrhotic liver tissue and regeneration nodules by the distribution of the blue-stained pigment alone.

Spleen.—Hæmosiderin is present in the fibrous trabeculæ and blood-vessel walls, and to a lesser extent in the reticulum cells of the pulp, especially round the Malpighian bodies. A considerable amount of hæmofuscin is also present. Otherwise the histological appearances are those usually found in portal venous obstruction.

Kidney.—Hæmosiderin is present in very small amounts in the lining epithelium of the second convoluted tubules.

Lung.—The scattered pleural nodules show the histology typical of old tuberculosis.

A few similar cases have been recorded, the most complete description, with an extensive review of the literature on hæmochromatosis, being that of Donaldson (1929), whose case differed from the above in that hæmosiderin was absent from the regeneration nodules as well as from the carcinoma cells. Bronzing and glycosuria were absent in his case as in this. Telling and Stewart (1921) mention two cases in both of which pigmentation of the skin was absent, but details are not given. In the case recorded by Blanton, Richmond, and Healy (1921), glycosuria was present and pigmentation of the skin absent. Hæmosiderin is stated to have been present in the carcinoma cells as well as in the cirrhotic liver tissue. Hibbs (1927) found pigment in the liver but not in the tumour; his case was a bile-duct carcinoma, all the others where histological accounts are given being liver-celled growths. Mills (1924) had two carcinomata of the liver in 17 cases of hæmochromatosis. Mallory, Parker, and Nye (1921) found the condition four times in 224 cases of cirrhosis of liver (the total presumably including all types of cirrhosis). Rowen and Mallory (1926), in an analysis of nine primary carcinomata of liver, seven of which were liver-celled growths, state that three of the latter were associated with "pigment cirrhosis." No cases have been found in continental literature.

My thanks are due to Dr. C. M. Wilson for allowing me to make use of the clinical case notes, and to Dr. W. D. Newcomb for his interest and helpful criticism.

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THE USE OF EXTRACT OF HOG SPLEEN IN DERMATOLOGY.

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During the last few months some interest has been aroused by an article on the Instantaneous-physiologic Cure of Eczema and Urticaria by Dr. Thomas M. Paul, of St. Joseph, Missouri.[1] Apparently as the result of the publication of this paper, a leading firm who specialise in the preparation of animal extracts have put a preparation of 40 per cent. isotonic solution of hog spleen on the market, and have titillated the dermatologists with Paul's assertion that "hives (i.e., urticaria) will disappear in 15 minutes, that the itching and oozing of an eczema will cease in half and hour, and that an eczematous lesion, regardless of its degree of lichenification, will vanish in a few days as the result of a hypodermic injection" of this solution. As Paul admits, the statement "seems preposterous," but he adds that "such has been the writer's experience in a series of 61 cases."

On reading his paper one finds that 34 of his patients received one injection; "16 received two; 9 received three; 5 received four; 3 received five; 3 received six; 2 received seven; 1 received eight; 1 ten; 1 eleven; and 1 thirteen injections each." He has treated 44 cases of eczema and 17 cases of urticaria, and these apparently comprise the "series of 61 cases." He has also treated two cases of pruritus ani et vulvæ, and one case of pruritus perinei (sic), and these "recovered promptly," but one is not surprised to learn that one case of miliaria, three of lichen planus, and one of psoriasis failed to respond to this line of treatment.

The following is a record of merely six cases of dermatological conditions which I have treated by the injection of 40 per cent. isotonic hog spleen solution :—

1. Miss A, aged 19, was first seen on April 14th, when she presented a typical urticarial eruption of moderate severity on the trunk. This was her first attack of urticaria, and had persisted for six weeks. No history of dietary indiscretion was obtainable, and no obvious septic foci were found on examination. 5 c.cm. 40 per cent. hog spleen solution were injected intramuscularly. She reported two days later that there had been no improvement in her condition.

2. Mr. B, aged 25, presented a generalised urticarial eruption of moderate severity affecting the trunk and limbs. He had suffered from the disease for 18 months, and a series of protein-sensitisation tests had given no definite results except a mild reaction to wool and horse hair. On marking the skin with the blunt end of a penholder weals developed in 12 seconds and persisted for some minutes. On Feb. 8th 15 c.cm. 40 per cent. hog spleen solution were injected deep subcutaneously into the buttock. Five minutes after the injection the "weal-development-time" was unchanged. On Feb. 12th he was again examined. He stated that the lesions present on his body at the time of injection disappeared in 24 hours, but 36 hours after the injection he "had a bad attack" during which his eyelids and lips swelled up. On examination the typical urticarial lesions were found on his body, and the eruption was quite as severe as at the time of the injection.

3. Mr. C, aged 50, had suffered from severe urticaria for years. There had been practically no intermissions of the disease during the whole of this time. On Jan. 21st 15 c.cm. 40 per cent. hog spleen solution were injected intramuscularly. No improvement whatever resulted.

4. Mr. D, aged 63, had acute vesicular eczema affecting the arms of one month's duration. On Feb. 28th, 15 c.cm. 40 per cent. hog spleen solution were administered deep subcutaneously. The affected areas were treated with ½-pastille dose of X rays, and he was given a solution of liquor carbonis detergens, and Lassar's paste with 1 per cent. ichthyol as local applications. One Kalzana tablet, thrice daily, after food was ordered. When next seen on March 7th his condition had improved considerably, but not more than one would have ordinarily expected had the injection not been given. The affected areas then presented a scaly erythematous eruption. He stated that no improvement had occurred during the first three days after the injection, but that there had been a gradual improvement thereafter.

5. Mrs. E was aged 41. On March 1st she received an injection of 15 c.cm. 40 per cent. hog spleen solution for a lichenified and pruriginous dermatitis affecting the arms and back. The condition had been present for two years, and had been remarkably resistant to treatment. No improvement resulted.

6. Mr. F, aged 74, had been under treatment since November, 1929, for an acute seborrhœic dermatitis affecting the head, ears, neck, and body. His condition had improved but slowly, and on March 18th, 1930, he reported that there had been a fresh outbreak affecting the arms. On examination one found an acute seborrhœic dermatitis of the arms with considerable serous exudation; 15 c.cm. 40 per cent. hog spleen solution were given intramuscularly, and dressings of calamine lotion were applied. Three days later he reported that "the arms had dried up within 24 hours of the injection." The condition had definitely improved; there was no exudation, but there remained a scaly erythematous dermatitis of moderate severity.

The six cases detailed above cannot be compared either in number or in effect with the series of 61 cases of "instantaneous-physiologic cures" which have been published in America. Despite the moderate improvement recorded in Case 6 I am extremely sceptical as to whether injections of 40 per cent. hog spleen solution are of the least value in the routine treatment of the commoner dermatological conditions.

[1] Urologic and Cutaneous Review, 1929, xxxiii., No. 11.

NAUHEIM TREATMENT AND CARBON DIOXIDE FOAM BATHS.

By L. Shillito, M.B. Camb.,

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The warm effervescing waters of Nauheim, in Germany, have become famous for their success in the treatment of cardiac weakness. The water is heavily charged with carbon dioxide, and also contains calcium chloride in solution, with other salts in smaller quantities, and various attempts have been made to introduce "Nauheim treatment" with artificially prepared solutions. Formulæ for this purpose may be found in Kellogg's "Rational Hydrotherapy,"[1] or Martindale and Westcott's "Extra Pharmacopœia," but the recent invention of what is known as a bubble or foam "distributor" (Baderost), for use with a cylinder of carbon dioxide and a little saponin solution, makes the whole process far more simple and easy to administer efficiently. It is doubtful whether the calcium chloride used in the chemically prepared baths has any effect beyond raising the specific gravity of the solution, as it is not absorbed, the main physiological effects being due to the carbon dioxide and to the temperature of the bath. The so-called "foam bath" apparatus has only been introduced into this country within the last year, and so far has not met with the serious consideration that it deserves, though on the Continent, and particularly in Germany, it has been widely used for some while with good results.

As I have now had the opportunity of some experience of this new method of giving Nauheim treatment, a practical description may help to popularise a form of treating heart disease of which the good results have long been well known, but in which the practical difficulties of administration were too great for it to be very much used in ordinary practice. All that is now required to carry out this treatment is a foam distributor obtainable either in this country or, more cheaply, abroad, a cylinder of carbon dioxide and the saponin solution, which can be bought from any good manufacturing chemist.

Administration.

The distributor consists of three parallel pipes held together in a frame and perforated along their length with a series of holes. Over these apertures are a number of porous blocks

of wood. The pipes are joined at either end and connected with the cylinder of gas, which escapes through the porous wood as very fine bubbles. If the bath is filled with water and the gas turned on, a simple aeration or bubble bath results; if, however, the distributor is only covered with a few inches of water, to which a little saponin solution has been added, a fine dense foam is formed which gradually fills the bath. The procedure is as follows.

1. Soak the distributor in water for some hours before use to allow the wooden blocks to swell and prevent leakage of gas between them. To prevent it scratching the bath, a rubber mat may be laid under it.

2. The bath is half filled with water at a temperature of 94–97° F. and 20 c.cm. of foam extract (saponin solution) is added. This is mixed well with the water before turning on the gas or air, a point of importance in securing fine foam free from large bubbles.

3. Compressed air is pumped through the distributor until a layer some inches thick of air-foam has been produced. In the absence of an electric air pump, an ordinary motor tyre pump can be used quite effectively. The air-foam cover prevents the carbon dioxide from escaping, as carbon dioxide foam will not last unless it is protected in this way.

4. Carbon dioxide is now bubbled through the distributor at a pressure of 0·15–0·2 of an atmosphere. The patient gets into the bath and remains there for 5–20 minutes, carbon dioxide being bubbled through the distributor the whole time. A rubber back rest and a folded towel as a head rest add to the comfort of the patient, who should be immersed in the bath up to his neck. The temperature of the bath is maintained by adding more hot water from time to time. No hard-and-fast rule can be laid down for the management of all cases, the duration of the bath and its temperature depending upon the degree and kind of disease, the pulse-rate, blood pressure, and personal idiosyncrasies.

5. Before, during, and after the bath its temperature and that of the patient are taken, and also the pulse, a fall of pulse-rate being aimed at. The blood pressure is also taken before and after the bath, a fall likewise being, as a rule, expected.

6. After the bath the patient goes to bed for an hour, and is not allowed to read, write, or talk during this period. The bed should be kept warm with a hot bottle. To destroy the foam in the bath, sprinkle with a jugful of soft soap solution.

7. At the beginning of a course of these baths, a bath for three to four minutes at 96–97° F. is given, and if the effect of this is satisfactory it may be repeated, and the period of immersion subsequently lengthened up to 15–20 minutes towards the end of treatment. The temperature is correspondingly lowered down to 94° or even 92° F.

8. Baths are given on two or three successive days, followed by a day's respite, and then repeated. The average number of baths in a course varies from 20 to 30, and the duration five to six weeks. Baths on alternate days may be found less fatiguing, and with women should not in any case be given during the menstrual period.

On the days when no bath is given "Schott" resisted exercises may with great advantage be carried out if the services of a skilled administrator are available. In the absence of such a person other suitable graduated exercise may be taken.

Physiological Effects.

1. The type of reaction obtained depends upon the temperature of the bath. Carbon dioxide baths are used practically solely for their effect on the circulation in cardiovascular disease, and in these conditions bathing above an indifferent degree of heat should be discouraged. At a neutral temperature a carbon dioxide bath has much the same effect on the surface circulation as a very hot bath, but has the advantage of avoiding the harmful, primary excitation and secondary depression produced by heat. As Hediger [7] points out, the carbon dioxide bath is the only physical method of treatment in which the heart muscle is trained without at the same time increasing the frequency of the beat. The slowing of the pulse-rate extends the period of diastole and enables the coronary vessels to be better filled with blood, which must tend to improve the nutrition of the myocardium. The blood pressure may fall 20 mm. of mercury during the course of one of these baths. In baths under indifferent degrees of temperature the peripheral vessels are contracted, the blood pressure rises, and consequently the work of the heart is increased. By a gradual increase of the carbon dioxide content and a reduction of the temperature of the bath, the heart can gradually be forced to do more work, and through this increasing exercise its musculature becomes strengthened, the tone increased, and reserve power augmented. The sensation of warmth produced by the strong circulatory reaction allows a lower temperature to be tolerated without shivering.

2. The powerful vasomotor effects are produced reflexly by the adhesion and bursting of myriads of small carbon dioxide bubbles against the skin, stimulating the superficial nerve-endings and producing redness and vaso-dilatation.

3. Viscera are relieved of congestion and the activity of the peripheral vessels greatly lessens the labour of the heart, and secures a better distribution and a more accurate movement of the blood throughout the body.

4. The increased activity of the skin lessens the strain on the kidneys, whereas diseased kidneys are likely to suffer serious injury from the temporary congestion which results from the contraction of the surface blood-vessels after either a hot or a cold surface application to the body.

5. A continuation in improvement of health for some months after the course of these baths is due, probably, to the comparatively slow and gradual process of repair in degenerated organs, provided, for the first time possibly for some years, with a more healthy and less abnormal circulation.

Indications.

The principal indication is myocardial weakness—for example, the dilated, feeble, and irritable heart following influenza and other fevers. Cardiac toxæmia or enfeeblement caused by excessive smoking or a prolonged illness such as typhoid or malaria, angina pectoris, and cardiac asthma are all benefited by this treatment, as may be also anæmia with dilated heart and high blood pressure.

The treatment is not suitable in heart cases with broken compensation, in very marked arterio-sclerosis, or in the very old.

Chronic nephritis may often be benefited, as in this disease the kidneys are likely to suffer serious injury from the temporary congestion resulting from the contraction of surface blood-vessels caused by very hot or very cold applications.

Neutral effervescent baths are also valuable in insomnia and mental excitement generally.

To conclude, the special advantages of the carbon dioxide foam baths are their simplicity, low cost, and the fact that the air-foam cover entirely conceals the patient's body from view, a practical point of some importance. They can be given in a patient's own home, and the distributor can also be used to give a sweating type of foam bath most useful in rheumatic affections.

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ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN.—Last year the in-patients numbered 228, a small increase; there were 10,607 out-patients. The pressure upon accommodation necessitates extensions, and it is hoped to place the in-patient department on a more modern basis and to increase the number of beds from 33 to 64, including a children's ward. Plans for rebuilding on this scale have been approved by the King's Fund. The possibility of acquiring a central site which would comprise both in-patient and out-patient departments is being considered. At present the former is in the Uxbridge-road, and the latter in Leicester-square.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF LARYNGOLOGY.

THE summer meeting took place on June 20th, the morning session being devoted to the reading and discussion of papers, and the afternoon to a clinical meeting.

Dr. DAN MCKENZIE, the President, rea a paper on the

GRADUAL DIATHERMY OF THE FAUCIAL TONSIL.

He said that diathermy was applied to the tonsils under local anæsthesia, more or less profound; in some cases no anæsthetic was needed. Cocaine he considered the best, but he was not fully satisfied with any existing local anæsthetic. His practice was to apply a solution of adrenalin (1 in 3000), following this with a 10 per cent. solution of stovaine. After ten minutes he painted the tonsils once or twice with the usual cocaine and adrenalin mixture (10 per cent. cocaine and 1 in 1000 adrenalin), and finally infiltrated the pillars and peritonsillar regions with novocain. Dr. McKenzie used five or six different types of electrode for the tonsil; a sharp, pencil-shaped electrode was particularly valuable for the body of the tonsil. For deeper areas he used a flat electrode, insulated all round. The simple needle electrode was the most useful of all. Electrodes should be short; those supplied by instrument makers were usually much too long.

In using diathermy the surgeon could do as much—or as little—as he pleased. Large portions of bulky and prominent tonsils could be safely destroyed at each sitting, using for this the larger electrodes. But when the tonsils were small—and in any case when the destruction was nearing the capsule—one should proceed slowly; bold procedure might cause hæmorrhage, though perhaps not until the sloughs were separating, and at that time the patient might be out of the operator's reach. The cause of this hæmorrhage was the destruction by diathermy of a segment of the vessel wall, the blood contained in the vessel not having been coagulated. By being content with shallow coagulations as the capsule was approached it was likely that hæmorrhage could be avoided. When near the capsule Dr. McKenzie used the needle electrode, since it enabled him to know the depth of the coagulation. In his experience it was well to begin by coagulating the upper pole of the tonsil, especially the parts around the supratonsillar recess. The most difficult part of the procedure was the dealing with the buried portion between the faucial pillars and high in the soft palate.

Clinical experience seemed to indicate that tonsillectomy was preferable to tonsillotomy. He had not yet decided whether the operator should strive for total or only for subtotal removal. If any were left, however, it should be as little as possible. To subject the pillars to diathermy was not only unnecessary but objectionable, because pain was then likely to occur in the ensuing days. Towards the end of the treatment considerable intervals should be observed between the sittings to allow the swelling to subside. In many patients who had suffered from rheumatism attributed to tonsillar infection, an improvement in symptoms followed the first application of diathermy. To prevent scarring, patience and considerable manipulative dexterity were needed. It was important to avoid using this method for genuine hæmophilics. The process was capable of the finest precision, and was likely to become popular among people who preferred at present to endure their symptoms rather than submit to the ordinary operation of tonsillectomy.

Discussion.

Dr. BROWN KELLY considered that any method which did not remove the entire tonsil was to be condemned.

Dr. J. S. FRASER said he had been confronted with one or two cases in which the tonsil was supposed to have been destroyed by the application of "London paste" and in which he had had to remove what was practically the same kind of tonsil stump as that left by the old guillotine method, which was a mere slicing of the tonsil.

Mr. MUSGRAVE WOODMAN said that "London paste" was rightly condemned because it left the tonsil in situ. It was unwise to leave any part of the tonsil.

Mr. BELL TAWSE said he had had no experience of removing tonsils by diathermy, but he had seen a woman who had her tonsils treated by this method by another surgeon, and had been promised a painless procedure. It was, in fact, very painful; the patient was in bed four days with a temperature, and was unable to swallow comfortably for ten days. He did not think a procedure which required patients to attend frequently was likely to become popular with the public.

The PRESIDENT, in reply, said that there were means of avoiding pain. In particular, the operator should avoid doing an excessive amount at any one sitting. It was admittedly a tedious process, but most of the results were admirable.

Dr. D. A. CROW contributed a paper illustrated by photographs on

THIRTY FOREIGN BODIES REMOVED FROM AIR AND FOOD PASSAGES.

He said that coins which were impacted below the crico-pharyngeal band did not present any special interest, provided the laryngologist got the case before it had been prejudiced by blundering attempts at removal. In many cases a local anæsthetic sufficed, but Dr. Crow preferred a general anæsthetic, particularly to obviate psychological trauma. The articles swallowed included not only coins, but brass and bone buttons, partridge bones, and dentures. A feeble-minded woman had swallowed a whole denture; her hypopharynx seemed to be devoid of sensation. A boy, aged 11, had swallowed a pencil-cap; it set up a lung abscess, which burst into the pleural cavity, and required rib resection. When Dr. Crow first saw the boy he was in a deplorable state; he was emaciated, the fingers were clubbed, and he was expectorating foul-smelling pus. Eventually Mr. J. R. Griffith removed the foreign body by external operation, and complete recovery followed. Dr. Crow thought that laryngologists were justified by their experience in urging dentists generally to take far more precautions than many of them now did, to prevent extracted teeth from slipping down the throat. A tooth should never be extracted too hurriedly; on every occasion a large gauze swab should be placed behind the site of operation. A dentist who took no steps to confirm by X rays a suspicion that a tooth had been swallowed or aspirated was not keeping faith with his patient. The most dramatic case of the series was one in which a doctor did a tonsil dissection on a child who showed sudden respiratory embarrassment and deep cyanosis. When Dr. Crow first saw the child it was conscious but grey in the face, and the pulse was only just perceptible. In three minutes under ethyl chloride anæsthesia, supplemented by chloroform, a foul-smelling swab was found tightly corking the left bronchus. Two or three days after this had been removed the child had completely recovered.

Discussion.

The PRESIDENT said that Dr. Crow's communication had shown that there were cases of foreign bodies in which the direct route was not successful. If the foreign body was large and had been in position a

considerable time, and especially if there were physical signs of rupture of the œsophagus, the direct method should not be attempted, and removal should be carried out by external operation. He had seen patients with surgical emphysema of the neck resulting from the use of the wrong method of extraction. The deeper planes of the neck should be opened as little as possible.

Mr. T. B. LAYTON assumed the coin-catcher would be condemned by Dr. Crow. Yet 9 of the 30 foreign bodies mentioned in his communication were coins. He (Mr Layton) was generally able to remove a coin in five seconds, and neither chloroform nor any other general anæsthetic was required. There was no need to use the endoscope for coins except when a coin got below the cricoid. In using the coin-catcher there should be no psychological trauma.

Dr. FRASER said he never used the coin-catcher; but he had had cases to deal with after an attempt at removal had been made in the out-patient department, and he always regretted that such attempts should be made. He could not see why a coin-catcher was preferred to œsophagoscopy or endoscopy. It was always safer and better to remove a coin when it could be seen than to grope for it more or less in the dark. If one failed to extract a tooth-plate after a reasonable time, it was better for an external operation to be carried out, since much damage could be done by hooks. For those cases he recommended a general anæsthetic.

Mr. MUSGRAVE WOODMAN also deprecated the use of the coin-catcher. In 50 per cent. of the cases in which it was employed the coin was pushed into the stomach, and then gastrostomy might be needed for its removal. It was said that it was easy to cut tooth plates in half to remove them, but he found that very difficult.

Mr. HAROLD KISCH agreed with Mr. Layton that the coin-catcher had a definite use. He thought that every student ought to be taught how to use it properly, since many would be practising in regions out of the reach of experts. The mortality from inexpert use of the endoscope would be higher than from the use of the coin-catcher. During the war the latter instrument had enabled him to extract many metallic foreign bodies in the absence of an endoscope.

Dr. DOUGLAS GUTHRIE referred to extraction by tracheotomy when the foreign body was below the glottis.

Mr. W. S. THACKER NEVILLE gave reasons for considering that the coin-catcher should be relegated to the museum.

Mr. HERBERT TILLEY said he had not seen a coin-catcher for 20 years. Even in the depths of the country an expert at œsophagoscopy could be procured for a case within a reasonable time, and these cases were practically never desperately urgent.

Mr. E. WATSON-WILLIAMS said his own teaching to students was that both the coin-catcher and the probang should be in the museum. An analysis of Chevalier Jackson's cases showed that all the fatal cases but one were due to the unskilful use of either the probang or the coin-catcher before the patients were brought for skilled endoscopy. The speaker had had two bad experiences in cases in which the probang had been tried.

Dr. RITCHIE RODGER feared that if the use of the coin-catcher were taught to students they would not restrict its use to coins when they were in practice.

Dr. A. BROWN KELLY read a paper on

CONGENITAL STENOSIS OF THE ŒSOPHAGUS ASSOCIATED WITH HIATAL HERNIA.

He described four cases in young children of œsophageal stenosis associated with hernia in the lower end of the stomach and the hiatus œsophagus. In all four cases the pregnancy was normal and the infant at birth was healthy; persistent vomiting and palpitation were the sole disabilities. One child was brought to hospital at the age of four weeks because of vomiting after its feeds; it did not take any food until the fourth day after birth. The obstruction was 20 cm. from the lips. Barium was given, and was shown by X rays in three large collections, one above the other. Special methods had to be used in these cases to dilate the sac—for example, with barium—otherwise the cause of the symptoms was likely to escape observation.—Mr. WATSON-WILLIAMS said this contribution provided him with the key to a case which had puzzled him, that of a patient aged 37 who had had swallowing difficulty for 17 years, and who was sent to him labelled carcinoma of the œsophagus. The patient when examined under general anæsthesia was found to have a constriction midway down the chest, which opened easily under the œsophagoscope, and the examiner found himself looking at the gastric mucosa.

Mr. WATSON-WILLIAMS read a paper on

GRANULOMA OF THE LARYNX FOLLOWING EXPOSURE TO IRRITANT GAS.

The general health of patients with granuloma due to mustard or other irritant gas might be good, but cough and expectoration would be present, and examination would show a semi-pedunculated, slightly crenated, reddish tumescence spreading from the subglottic region. Sometimes this tumescence was sufficiently movable to be blown up between the cords. Quite a long interval might elapse between the exposure to irritant gas and the formation of the tumour; in Mr. Tilley's case it was 15 months, in Mr. Bell Tawse's it was 14 years, and in the reader's own cases the intervals were 5½, 7, and 9 years. In all there had been some continuity of symptoms from the time of exposure to the gas to the discovery of the tumour. More definite knowledge showed that revision of pension decisions might justly be made.—Sir STCLAIR THOMSON thought some of these cases, which were quite rare, might be associated, in the first instance, with submucous hæmorrhage.—Mr. BELL TAWSE described a case, and asked whether members could support his present contention that the man should be granted his pension.

Dr. GUTHRIE and several other members of the Section agreed that he should.

Mr. NEVILLE contributed a paper on

AVERTIN AS A BASAL NARCOTIC IN LARYNGOLOGY.

He said avertin was most safely given by the rectum. Three contra-indications were kidney disease, low pressure, and grave sepsis and empyema. He claimed that it was non-toxic, harmless, quick in action, banished dread of the operation, and was especially suitable for children. Avertin was not itself an anæsthetic, but was a basis for a narcotic. He described in detail his method of procedure.

Sir STCLAIR THOMSON pointed out that the state of unconsciousness for two hours and sleepiness for three days was, especially in laryngeal conditions, something strenuously to be avoided. The absence of laryngeal reaction in these patients after the use of avertin was very alarming.

Dr. FITZGERALD POWELL described his use of the drug and concluded that it was not a safe anæsthetic.

Mr. V. E. NEGUS thought there were great objections to this drug; with the patient on the move and able to carry on a conversation it was hopeless to attempt any intranasal operation.

Mr. NEVILLE, in reply, agreed with some of the criticisms, but contended that its use was justified chiefly because of its psychological advantage, particularly in the case of children.

The afternoon session was devoted to the examination and discussion of clinical cases.

SECTION FOR THE STUDY OF DISEASE IN CHILDREN.

EXHIBITION OF CASES AND SPECIMENS.

A MEETING of this Section was held on June 21st at the Jenny Lind Hospital, Norwich, the President, Mr. H. A. T. FAIRBANK, occupying the chair. The cases exhibited and discussed included the following.

Arrested Development: Neanderthal Physiognomy.

Dr. A. J. CLEVELAND showed a young man, aged 22, who, though healthy at birth, suffered retardation of growth in infancy. He never had the aspect of a typical cretin. When Dr. Cleveland first saw him 15 years ago his appearance was very much that of primitive ancestors, and the case illustrated Sir Arthur Keith's remark in his "Antiquity of Man" that certain types of primitive man and of pathological man closely resembled one another. At 4 years of age the patient had beetling brows, a bowed back, a shuffling gait, and a curved lower jaw. X rays showed that the well-developed superciliary ridges were due to large frontal sinuses. There was a defective mentality. The patient would not go to the dentist to have his teeth examined. Though in early childhood he did not respond to thyroid, he did so at a later stage, and between April, 1927, and October, 1929, he had grown 9¾ inches. The sella turcica seemed normal.

Sir HAMILTON BALLANCE showed a case of

Double Colon

in a girl aged 10. At the lower end of the posterior vaginal wall were two distinct rectal orifices, one on the right, the other on the left. One and a half inches behind the anal orifice was an anal dimple in the perineum. An attempt in London to cure the imperforate anus had failed, and a further attempt at a Norwich hospital had no better result. Sir Hamilton did a temporary colostomy in the transverse colon in order to secure a clear field for the perineal operation, and four months later the colostomy wound was closed. The operation disclosed that the doubling extended nearly to the cæcum. He excised some inches of the transverse colon, and he showed a specimen of it, with skiagrams. There was a perfect septum between the two coli, and the septum contained some fibrous tissue, but probably no muscle. Three examples of double intestine were in the College of Surgeons Museum; the only explanation Sir Arthur Keith could suggest for the present case was that it represented a feeble attempt at dichotomy, which had failed.

Dr. H. J. STARLING showed the following three cases.

Persistent Pyrexia.

The question arose whether a girl of 15 who had persistent pyrexia was the victim of Still's disease. In April, 1928, she was admitted to hospital because of a two years' history of persistent pyrexia, over a range from 99° to 104° F., accompanied by pain and swelling in most of the joints, and cardiac symptoms which suggested infective endocarditis. Her head was bent forward, because of fixation of cervical vertebræ, and, even under an anæsthetic, the full range of the opening of the mouth did not exceed ¾ inch. The left wrist was completely ankylosed, and movement in knee- and ankle-joints was restricted. With difficulty—owing to the partial closure of the mouth—the tonsils were removed, and treatment was carried out by means of polyvalent anti-rheumatic vaccine and intramuscular peptone injections, with great improvement for a considerable time. But last September she was readmitted because of a relapse during the preceding three months. Her white cells were now 32,500, and during attacks of increased temperature they varied between 56,000 and 7400. Blood culture and examination of fæces and urine were negative, nor was there evidence of focal infection. Protein shock was induced, the agent used being D'melcos, and last January she was discharged much improved. She had since relapsed again.

Cœliac Disease.

A boy 11 years old was healthy at birth, but at 9 months old, when weaned, he began to dwindle and became exceedingly thin. Some degree of rickets was present. He improved, but the abdomen was always large and the motions loose. In 1924 he had attacks of tetany. He was given a fat-limited diet, and some time after this was begun, though the stools were very bulky, they were normal in colour and less offensive than before. They contained much fatty acid crystal and undigested muscle-fibre. He was kept on a fat-free diet for four years, by which time he was going to school and playing games. He was now in a cadet corps, and ate eggs, meat, chicken, fruit, vegetables, rice puddings, and cornflour made without milk. No fats as such were eaten.—Dr. ERIC PRITCHARD raised the question whether in such a case as this the absence of fat from the diet, per se, was of great importance in regard to maintaining the nutrition. The important matter was the absence of fat-soluble vitamin, and that could be easily put right without supplying fat. He gave such cases cod-liver oil, carotene, and other substances. The manufacturers of a certain brand of margarine were deliberately incorporating in their products a tasteless fat-soluble vitamin. Suet-beef was excellent for these cases.

Syringomyelia with Retrobulbar Neuritis.

He had made this tentative diagnosis in a girl of 15, the chief feature of whose case was the marked remissions which occurred. The mother had an enlarged thyroid and was deaf, otherwise the parents were healthy. In July last this girl's leg began to drag, and she was in bed three weeks. Then she was able to walk normally for a month. At the end of the month leg-dragging was resumed, and only on two or three subsequent occasions had she been able to walk, and then only with difficulty. She said the legs felt numb. She had incontinence of urine in the night, and sometimes also in the day. Appetite had remained good, and the bowels were regular. Heart and lungs appeared to be normal. Her back was curved, with the convexity to the left in the dorsal region, the ribs on that side forming a prominence. Both knee-jerks were feeble; the left ankle-jerk was absent, as were also the biceps-jerks. In both hands there was a marked loss of power. The pupils reacted to light and accommodation, but the left disc showed partial atrophy, which Dr. G. Maxted attributed to retrobulbar neuritis. The left field showed a central scotoma. On lumbar puncture the fluid was clear, and globulin and sugar contents were normal. The Wassermann was negative in both blood and c.-s. fluid. Coliform bacilli were present in urine obtained by catheter. After treatment at Norwich and at Guy's Hospital the girl could walk normally, but a week ago she relapsed; there was now no power in the limbs and both knee-jerks were absent.—Dr. WILKIE SCOTT suggested that the girl might have encephalomyelitis which, in a subacute stage, could cause a patchy distribution, and this might be a forerunner of disseminated sclerosis. Dr. Starling did not think this likely.

Mr. F. K. HAYMAN exhibited a boy, aged 14, who was the subject of

Cerebral Hæmorrhages.

When 10 years of age the boy found his left leg useless on dismounting from his bicycle. He was fully conscious and remembered all details. His pulse-rate was found to be 84, and there was no history of injury, yet he was found to have (1) complete flaccid paralysis of the left arm and hand; (2) partial spastic paralysis of the left leg, with feeble knee-jerk and extensor plantar response; (3) partial

paralysis of the left side of the face; (4) hemianæsthesia of left side (back and front) extending from head to foot. On the following day he had left oculomotor paralysis. Rapid improvement followed, and in 3½ weeks he could walk fairly well and use his hands. He was thought to have had a small hæmorrhage in the right crus cerebri. Last February, while doing clerical work, he had severe headache at the vertex, with vomiting, but there were no physical signs, and both pulse and temperature were normal. On the following day, however, the headache was worse and he had head retraction. Mr. Hayman thought the patient had a leaking congenital aneurysm at the base of the brain, and that the first symptoms were due to rupture of it, and the subsequent ones to leakage. The Wassermann was negative.—Dr. A. A. MONCRIEFF asked whether ligature of the right carotid artery might be of benefit; this might conceivably save the patient further hæmorrhages, with a possible fatal termination.—Dr. WILKIE SCOTT spoke of a patient, a boy, who had three recurrences of bleeding, the third being fatal. Blood was mixed with the cerebro-spinal fluid, and all his attacks came on after exertion. In another patient on two occasions attacks came on after riding a bicycle. A month ago Dr. Scott had made a post-mortem examination on a man, aged 25, who appeared quite healthy, was a teetotaller and non-smoker. He was suddenly seized with severe pain in the head and became unconscious. A month later he had a similar attack and died in it. A cerebral aneurysm half the size of a hazel-nut was found. Usually these were regarded as cases of meningitis.

Mr. G. MAXTED showed a girl 10 years of age who had

Unilateral Exophthalmos.

On the admission of the girl to hospital in July, 1927, because of carditis, proptosis of the right eye was noted. Since December of that year she had been in hospital with pericarditis and effusion, and general œdema. There was no accompanying diplopia; the pupil reacted normally and the disc appeared to be healthy. Vision in the right eye was 6/12, but there was a hypermetropia of 3D. The fellow eye was emmetropic. Globe movements were not hampered. There was no nasal abnormality. The heart was enlarged, and there was a loud systolic bruit at the apex, with systolic and diastolic bruits in the aortic area. Mr. Maxted thought she might have a non-malignant tumour of the optic sheath, since the condition was not becoming worse.—Dr. F. J. POYNTON suggested that she might be a rheumatic child with a tendency to hæmorrhages, which when they occurred were gradually absorbed.

Mr. MAXTED also demonstrated a girl aged 6 years with

Bilateral Congenital Dislocation of Lens.

She was brought to the hospital for advice six months ago because she held objects very close to her eyes. Each lens was seen to be partially dislocated and to be the seat of well-marked lamellar cataract. Five months ago the right eye was needled twice. Most of that lens was now absorbed, leaving a clear area in the outer half of the pupil. She was now wearing a correcting lens for this eye.

Mr. M. W. BULMAN showed a boy, aged 8, with

Congenital Scoliosis.

His back had been deformed ever since birth, and he presented a marked lateral curvature in the dorso-lumbar region which was not amenable to corrective efforts. On the right side there was only half a twelfth dorsal vertebra, and there was a twelfth rib on the left side. He asked whether the case called for an appliance to prevent the condition from becoming worse.—The PRESIDENT said these cases were not promising, and he had usually been content to put on a jacket of some kind, particularly for small children who were growing fast.

Dr. B. MORGAN showed a boy, aged 11, who had

Symptoms Associated with Cervical Rib.

He had had weakness in both hands for three years; the hands, with the lower third of the forearms, were blue and cold, and both, but especially the left, were claw hands. It was impossible to abduct the fingers of the left hand. There were no sensory, tactile, pain, or thermic disturbances. X rays showed a rudimentary cervical rib on the right side, and an enlarged transverse process of the seventh cervical vertebra on the left. There was also subluxation of the left sternoclavicular joint. Dr. Morgan said that it was very rare for symptoms to be attributable to cervical rib, and that in this case they were much more likely to be due to a fibrous band which ran to the first thoracic rib. He thought that surgery should be tried.—The PRESIDENT also commented on the rarity of symptoms due to cervical rib.—Mr. ERIC LLOYD referred to a case at Great Ormond-street Children's Hospital in which a child's symptoms had been attributed to cervical rib, but the diagnosis arrived at in hospital was syringomyelia.

In the absence of Dr. V. H. BLAKES his case of

Hirschsprung's Disease Treated with a Rectal Tube

was shown by Dr. MORGAN. The patient was a girl, aged 6, who when eight days old had had extreme constipation and had brought up a motion in the vomit. Castor oil relieved her, but she was always constipated, and the motion passed after a four or five days' interval was very offensive. The abdomen was much ballooned and the child was greatly emaciated. The rectal sphincter was very tight. The treatment adopted was to tie a small flanged empyema tube into the anus at night by tapes attached to a belt. After two nights of this the abdomen became flaccid, and its circumference was 6 inches less. Eserine and pituitrin were given for five months, followed by an enema and lavage in the morning. The patient was now strong and well and the bowels were functioning normally.

EDINBURGH OBSTETRICAL SOCIETY.

A MEETING of this Society was held on May 14th, with the President, Dr. H. S. DAVIDSON, in the chair. A paper on

The Value of the Dick Test in Pregnancy

was communicated by Dr. D. BAIRD and Dr. R. CRUICKSHANK (Glasgow). Last year, they stated, an investigation was conducted at the Glasgow Royal Maternity and Women's Hospital into the value of the Dick test—i.e., the cutaneous reaction to the intradermal injection of scarlatinal streptococcal toxin—as an index of susceptibility to puerperal sepsis. Because of the generally accepted view that the toxins produced by the scarlatinal and puerperal hæmolytic streptococci are identical, it was thought possible that sensitiveness to the one might indicate a similar degree of susceptibility to the other, and, if this were so, that the test might be of value in the prophylaxis of puerperal sepsis.

The Dick test was performed in a series of 600 pregnant women, either during labour or in the last few weeks of pregnancy. Careful histories were taken on cards specially designed for the purpose, particular note being made of previous streptococcal infection—e.g., scarlet fever, tonsillitis, puerperal sepsis—of the obstetric history, and of the health during the current pregnancy. Full particulars were subsequently obtained regarding the mode of delivery, the presence of lacerations, and the puerperium in 500 of these cases; where the puerperium was morbid, even although not notifiable according to the British Medical Association standard, it was classed as puerperal sepsis, care being taken to eliminate those cases of pyrexia due to other causes, such as urinary infection. A number of cases with a positive Dick test who developed pyrexia in the puerperium were retested immediately after the pyrexial

period to see if any change in the reaction had occurred. Some of these were again tested six months later.

It was found that 22 per cent. of pregnant women gave a positive reaction to the Dick test, primiparæ giving a slightly higher rate than multiparæ, 25 per cent. as compared with 21·5 per cent. The reaction seemed to be more intense in primiparæ, irrespective of age, than in multiparæ. In the latter there was a decrease in the intensity of the reaction in the older age-groups which might indicate that with each pregnancy the patient had a chance, by repeated slight infection, of becoming more immune. The incidence of puerperal morbidity also became less with advancing years in multiparæ, but remained constant for all ages in primiparæ.

The incidence of puerperal sepsis was so dependent on the general health of the patient and upon the type of delivery that any reliance on the Dick test as an indication of liability to sepsis would not be justifiable. It appeared, however, that in the present state of obstetric practice an attempt to produce a temporary immunity with a concentrated anti-scarlet serum in all suspect cases at the time of delivery might reduce the incidence of puerperal sepsis.

Drs. BAIRD and CRUICKSHANK also communicated a paper entitled

A Study of the Vaginal Flora in Pregnancy.

The physiological changes in the flora of the vagina were first reviewed, special attention being drawn to the apparently dramatic change at puberty from a sparse coccal flora and an alkaline reaction to a flora consisting entirely of Döderlein's vaginal bacillus associated with a highly acid reaction of the vaginal secretion. This change had been attributed by Miura, a Japanese worker, to the deposition of glycogen in the superficial vaginal epithelium when ovulation began, and the bacterial fermentation of the glycogen as glucose for the production of lactic acid in such concentration as to destroy all organisms save Döderlein's bacillus. Miura had also stated that in pregnant women there was an increased acidity of the vaginal secretion as pregnancy advanced.

The present investigation dealt with the vaginal flora of 200 pregnant women, a large proportion of whom attended at monthly intervals from the third month of pregnancy until term. Swabs were taken from the vaginal vault and smears and cultures made. The pH of the vaginal secretion which was collected at the same time with a long-handled spoon was estimated by the "capillator" method.

A classification into three grades of vaginal flora was made: Grade A, composed entirely of Döderlein's bacillus, the pH of the secretion varying only from 4·0–4·4; Grade B, containing a mixture of Döderlein's bacillus and diphtheroids, pH, 4·6–5·2; and Grade C, consisting of an abundant heterogeneous flora of diphtheroids, enterococci, staphylococci, and occasionally vibrios and coliform bacilli, pH, 4·8–6·8 with a more common range of 5·2–5·6. Large epithelial cells were particularly numerous in Grade A flora.

Of 200 pregnant women when first seen, 56 per cent. had Grade A flora, 10 per cent. Grade B, and 34 per cent. Grade C. Of the women who were followed throughout pregnancy there was found a remarkable constancy in the vaginal flora and in the pH of the vaginal secretion in those cases with Grade A flora. The women with Grade B or C flora were divided into those with pus cells in the vaginal smear—an indication of infection of the cervix of vagina—and a group with "idiopathic" Grade C flora, that is, an abundant mixed bacterial flora without pus cells. The flora in the former group remained Grade B or C throughout, but in the latter group the flora changed from Grade C to A in two-thirds of 21 cases followed to term, the improvement occurring usually about the sixth or seventh month of pregnancy.

The thesis was formed that there was some relation between the vaginal flora and ovarian activity, a Grade A flora being a reflex of actively functional ovaries whereas hypo-ovarianism was reflected in a Grade C flora. It was held that the association of an idiopathic Grade C flora with greater age and with a tendency to repeated abortion and the change-over from a Grade C to A flora during pregnancy were findings which supported this view. No evidence has been found to indicate that a Grade C flora increased the susceptibility to puerperal sepsis, but the number of women examined was too small to allow of definite conclusions.

ASSOCIATION OF CLINICAL PATHOLOGISTS.

THE fourth summer meeting was held at the Cheltenham General and Eye Hospital on June 14th. Dr. J. B. Davey, pathologist to the hospital, occupied the chair.—Dr. T. C. Hunt described a combination of a water excretion and urea-concentration test for renal function.—Dr. S. C. Dyke gave a brief preliminary report upon the phosphate concentration test of Brain and Kay for estimation of renal function; he had found the test somewhat unwieldy for ordinary clinical use.—Dr. A. F. S. Sladden discussed the importance of the urinary acid-ammonia ratio as an index of renal health; he pointed out that this ratio is extremely constant, and that any departure from the normal in the absence of alkali therapy is an indication of disturbed renal function.—Dr. Dyke opened a discussion on the urea-concentration test in the course of which he asked at what stage of the test a specimen of blood for estimation of urea should be taken; opinion differed widely on this point. The speaker stated that inasmuch as he regarded the test as one of the concentrating power of the kidneys, it has been his custom always to take the blood at the third hour.—Dr. Davey reviewed the results of the urea-concentration test as an indication for complete prostatectomy. In the course of the afternoon session, demonstrations were given as follows: Dr. A. Renshaw, a self-filling burette for routine analytical work; a new type of chamber for counting the cells of the blood and other technical devices; Dr. Dyke, mice showing results of Zondek-Aschheim test for pregnancy; Dr. A. L. Taylor, recent additions to the pathological museum of the Bristol General Hospital; Dr. E. N. Davey, pathological specimens from the Gloucester General Hospital, and an unusual type of typhoid bacillus isolated from a suppurating mesenteric cyst. Dr. J. R. Collins, senior physician to the Cheltenham Hospital, addressed the members on the "Sins of the Pathologist"; in the course of the evening a party of members was shown round the baths by Mr. T. Holmes, senior surgeon to the hospital.

ORTHOPÆDIC HOSPITALS.—The fifth annual report of the Royal Cripples' Hospital, Birmingham, states that the work of coördination has gone steadily forward since the institution was formed by the amalgamation of the Birmingham Cripples' Union and the Royal Orthopædic and Spinal Hospital in 1925. The Newhall-street Hospital has been closed and the patients transferred to Woodlands, where three new wards have been provided, together with an operating block and a nurses' home. Woodlands will now accommodate 50 adults and 130 children, and the cost of the improvements has been £47,000. The arrangements with the Birmingham health and education committees are working so smoothly that it is now practically impossible for any Birmingham child under 14 requiring orthopædic treatment to be overlooked. It is hoped in the near future to open further extern clinics. During the past year a training centre and hostel for masseuses, which has room for 20 resident students, was opened.—Last year the Shropshire Orthopædic Hospital and Agnes Hunt Surgical Home, at Oswestry, treated 610 adults and 563 children in-patients; over 40,000 massage and gymnastic treatments were given, and 523 operations performed. The after-care scheme grows more important every year, and a closer liaison has been created between the hospital and various local authorities and voluntary orthopædic associations. In return for a payment of £1 per quarter per patient attending at any of the treatment centres the hospital undertakes to provide orthopædic, surgical, and nursing attendance, to supply splints and appliances, and to alter boots surgically. With an income of £48,541, there was a credit balance on the year of £30.

Reviews and Notices of Books.

PSYCHIATRY.

La folie et la guerre de 1914–1918. By A. RODIET, Médecin-Chef de l'Asile de Ville-Evrard; and A. FRIBOURG-BLANC, Professeur au Val-de-Grâce. Paris: Felix Alcan. 1930. Pp. 194. Fr.30.

AFTER a brief historical comparison of the last war with that of 1870, the authors describe their efforts to collect statistics on the subject of the incidence of insanity in relation to the war of 1914–18. The few replies quoted show that this proved impossible, and they decided to confine their work to the adequate records kept of 25,000 cases which passed through Val-de-Grâce. Much space is wasted on ordinary descriptions of the different recognised forms of psychosis, and case-histories are given of samples of each. The one form supposed peculiar to war—"obusite," or shell-shock, is shown to include a variety of different conditions and no specific syndrome. The authors' general conclusion is that while most of the war cases would probably have had similar illnesses without the war, this did form an unusual stress which, to some extent, contributed to the mental breakdown, and even determined it in some who might have stood an easier life than that of a soldier. They differ from most observers in judging that cases recovered or improved can usefully be re-employed in the army. The question of pensionability is adequately discussed. The most interesting section in the book deals with experiments in suitable chronic and improved cases in village communities grouped round a central psychiatric unit and under proper supervision. This system has been tried with success in the Seine district, and is advocated in principle. Brief suggestions are made as to proper organisation of a psychiatric service for war conditions, and especially for the detection of psychopathic persons called up for service, with a view to placing them where they can perform useful service while avoiding such stress as might precipitate an acute breakdown. Malingering and simulation of insanity were found to be of relatively rare occurrence. The book would be much better if compressed to a quarter of its length, and if all matter not directly relating to war manifestations were rigorously excluded.

Manuel élémentaire de psychiatrie. By M. NATHAN, Ex-interne des Hôpitaux, Ancien Chef de clinique a la Faculté de Paris. Paris: Masson et Cie. 1930. Pp. 319. Fr.30.

THIS is an ordinary small text-book, giving general descriptions of the different types of psychosis and neurosis. After an introduction discussing modes of classification, the descriptions of syndromes are grouped into emotional and organic; in the former the author includes not only the neuroses and manic-depressive psychoses, but also schizophrenias, epilepsy, and confusional states, while all toxic psychoses including drug addiction are placed in the latter group. The final chapter on treatment is brief, and not likely to enlighten the student greatly; one section deals with tests using drugs affecting the autonomic nervous system, the idea being to use in treatment those which correct a "vagotonie" or "sympathicotonie." Another talks vaguely of acidity and blood pH, but advises only the administration of sod. bicarb. and calcium on the vaguest indications, while a general try-out of hormones is also advocated on no definite plan. The final chapter deals with methods of voluntary and certified admission, and the book ends with a prehistoric picture of the application of a variety of obsolete forms of mechanical restraint. Under psychotherapy is included a brief account of psycho-analysis, with no indication of the difficulty, if not impossibility, of its application to psychotic patients. It has to be remembered that the author claims to have written only an elementary manual, for one would be sorry for him who fared forth into psychiatric practice with no other guide than this book provides.

Psychiatrie du médecin praticien. Second edition. By M. DIDE, Directeur Médecin de l'Asile de Braqueville; and P. GUIRAUD, Médecin-Chef des Asiles de la Seine. Paris: Masson et Cie. Pp. 466. Fr.45.

THIS is a thoroughly adequate and complete guide to psychiatry, beginning with general psychology and its disorders, then passing to a well-arranged description of the main psychoses and neuroses, their ætiology, clinical manifestations, differential diagnosis and treatment, and giving useful summaries and tables differentiating syndromes. A detailed account of the procedure for examination of a mental case and the possible procedure to be adopted for care and treatment follows, with particulars of the legal requirements. Next comes a most practical chapter on treatment, and the essential methods of pathological investigation of the cerebro-spinal fluid, which would be improved by the addition of exact instructions on doing a lumbar puncture. The book ends with an excellent summary of medico-legal questions relating to psychiatry, including criminal responsibility. A specially pleasing feature is the number of admirable reproductions of portraits of cases showing typical attitudes and facial expressions. In the almost complete absence of errors of printing we may note the misspelling of Schilder as Schidler, in the description of the periaxial encephalitis named after that authority.

Le traitement de la paralysie générale et du tabès par la malaria provoquée. By A. FRIBOURG-BLANC, Professeur agrégé au Val-de-Grâce. Paris: Masson et Cie. Pp. 120. Fr.15.

THIS little handbook sums up clearly the main points any practitioner will wish to know about this treatment. It gives the history of the method, evaluates its results, and provides full particulars of its application, with details of the dangers to be watched for and the means of meeting them. In the descriptions of methods of inoculation and preservation of blood for transport, no mention is made of the use of the mosquito for this purpose; the author gives evidence supporting the view that the induced strain of benign tertian cannot be transmitted through the mosquito, and states that the precautions against possible spread which are required in this country are wholly unnecessary. Full case-histories are given of typical cases, and the symptoms and signs which do and do not improve in those patients who derive general benefit are clearly set out. In tabes the author finds that subjective symptoms, notably visceral crises and lancinating pains, and also the general lack of muscle tone, are improved, while other manifestations show little change. The book is concise, while it leaves out nothing of real importance to anyone wishing to apply the treatment in practice.

A SYNOPSIS OF SURGERY.

Ninth edition. By ERNEST W. HEY GROVES, M.S., M.D. Lond., F.R.C.S. Eng., Surgeon to Bristol General Hospital, Professor of Surgery, Bristol University. Bristol: John Wright and Sons, Ltd. 1930. Pp. 670. 17*s.* 6*d.*

Prof. Hey Groves deserves congratulation on the thoroughness with which he has carried out the task of revision, since there is no statement to be found in the ninth edition of this popular book which is not in line with modern practice and teaching. To summarise the facts of surgical practice in 670 pages is no mean achievement, and when it is added that the summary is clear, full, and complete, and

further that it is illustrated, we can appreciate the difficulty of the task Mr. Hey Groves has ably fulfilled. Of the new inclusions the paragraph on radium on p. 75 is perhaps the least happy, in that it does not give a complete nor accurate account of modern radium therapy.

It is unnecessary to tell students that they will find this book of great help in revision, since this verdict has already been given by successive batches of students since 1908. Practitioners will find in it a useful and rapid means of refreshing their knowledge of any particular surgical problem.

GRAY'S ANATOMY.

Twenty-fourth edition. Edited by T. B. JOHNSTON, M.B., Ch.B., Professor of Anatomy, University of London, Guy's Hospital Medical School. London: Longmans, Green and Co., Ltd. 1930. Pp. 1466. 42*s*.

Prof. Howden, after more than a quarter of a century as editor of this famous text-book, resigned the onerous position last year. This edition, then, is the first which has appeared under the ægis of Prof. Johnston, whose labours have met with great success. We are impressed by the evidence of careful and systematic revision which appear throughout the book. The frequent inclusion of very recent work in the general narrative is noteworthy, for this is not a common feature of text-books. The section on the central nervous system has been rewritten in large part, and many new figures have been added, so that this section is about half as long again as it was in previous issues. The new work has been very well done, as indeed are all the additions made by the editor. We notice a tendency to curtail the short paragraphs which were, in some sense, a feature of "Gray," under the name of applied anatomy, and this is, in our view, a move in the right direction. "Applied Anatomy" is only another name for medicine or surgery in one of their multiple spheres of activity, and its teaching, in the view of most anatomists, should be left to a later stage of the curriculum. While offering congratulations to Prof. Johnston we may add that, on grounds of sentiment, we rejoice to see this great work back in London, where it had its birth more than 70 years ago.

CHEMICAL METHODS IN CLINICAL MEDICINE.

Second edition. By G. A. HARRISON, B.A., M.D., B.Ch. Cantab., M.R.C.S. Eng., L.R.C.P. Lond., Reader in Chemical Pathology in the University of London; Chemical Pathologist to St. Bartholomew's Hospital. London: J. and A. Churchill. 1930. Pp. 534. 18*s*.

OF recent years the subject of chemical pathology has received a considerable amount of attention from publishers. Books dealing with the use of chemical methods in the diagnosis of medical and surgical conditions fall usually into two categories: (1) those intended mainly for the laboratory worker, containing detailed accounts of the technique, and (2) those in which the actual technical consideration is not set out at length but where great attention is paid to the use and interpretation of the method. The latter are intended primarily for clinicians and form very useful additions to the literature. A number of books have appeared of recent years of both these types, among them this volume just published by Dr. G. A. Harrison stands out. Since the author is chemical pathologist to St. Bartholomew's Hospital, it follows that the experience behind the book must be extensive, and its lessons have been admirably assimilated. The scope of the book may be judged from the first paragraph of the preface, which contains samples of questions commonly asked by the student, the practitioner, and the laboratory worker, respectively. "Which book gives the subjects dealt with in your classes?" "What is the meaning of these analytical results?" "How do you estimate such and such a substance?" The author has attempted to provide answers to all these and to similar questions. In other words, he has tried to write a book valuable to students, practitioners, and laboratory workers, and has succeeded.

The contents of the book cover the whole field of biochemistry as applied to medical and surgical diagnosis and treatment. After an introduction containing some very useful notes on solutions and apparatus, Dr. Harrison, in the following chapters, gives a detailed account of the routine tests on urine and tests for renal efficiency and for the presence of abnormal constituents in the urine, showing how these examinations can help the practitioner in the diagnosis and treatment of his cases. Blood analyses also are fully explained, and the final chapters deal with gastric analyses, determination of the basal metabolic rate, and methods of examining the cerebrospinal fluid. The chapter on investigations in diabetes mellitus and the control of insulin treatment is particularly good. In addition to the chemical details the book contains diets on Lawrence's well-known "line-ration" scheme; this is of great value to the clinician since it enables him to find in this one book all that he requires to know concerning the modern treatment of cases of diabetes.

TISSUE CULTURE.

Praktikum der Gewebepflege oder Explantation besonders der Gewebezüchtung. Second edition. By RHODA ERDMANN. Berlin: Julius Springer. 1930. Pp. 148. R.M.14.80.

THERE have been many advances in tissue culture during the eight years since the first edition of this book came out, and Prof. Erdmann has had much to add and amend. The result of her revision has been the production of an extremely valuable and up-to-date text-book on the subject. Prof. Erdmann uses excellent sketches to illustrate her technique in in drawing blood from animals; these have the advantage over photographs in that no essential details can be missed. The methods used by A. Carrel and G. Fischer in maintaining sustained growth of tissue over long periods of time are fully described. The chapter on the growth in vitro of nervous tissue, muscle, epithelial and connective tissue is abundantly illustrated, and the much disputed subject of the production and cultivation of pure strains of cells is discussed at some length. The pathological aspect of tissue culture is dealt with in the concluding chapter where, among other subjects, the growth of malignant cells and the influence of invading bacteria are described.

This is a book that should be read by everyone interested in the cultivation and study of animal tissue in vitro; those unfamiliar with the German language would doubtless welcome a translation.

HANDBOOK OF THERAPEUTICS.

By DAVID CAMPBELL, *M.C.*, M.A., B.Sc., M.D., "Pollok" Lecturer in Materia Medica and Pharmacology in the University of Glasgow; Assistant Physician to the Western Infirmary of Glasgow. Edinburgh: E. and S. Livingstone. 1930. Pp. 411. 12*s*. 6*d*.

THIS work is modestly termed a handbook, but it is much more than this. It is, indeed, a comprehensive treatise on therapeutics, full of up-to-date information given in a concise form. In the treatment of each separate condition Dr. Campbell has given us the results of a wide experience during which his critical outlook has remained keen, as the reader will admit when viewing therapy stripped of unnecessary frills. The work is well up to date; a paragraph notes on the uses of plasmochin in malignant tertian

malaria, while the value of ouabain, quinidine, and novarsural in special heart conditions, and the use of ephedrine in asthma are also assessed. In the paragraphs on coughs the author gives an interesting diagram representing the cough reflex. He reminds us that being a reflex a cough has a definite purpose, and therefore should not be suppressed without a careful consideration as to whether it is of benefit to the patient or not. According to him, analysis of patent cough mixtures shows that the majority contain some preparation of the alkaloids of opium; their efficacy in allaying cough is therefore measured in terms of their narcotic content. It is remarkable that in the treatment of acute and chronic nephritis jalap is recommended. Since jalap is now recognised to be a potent kidney irritant, and is even used experimentally on animals to affect the kidneys, its use in the treatment of nephritis would seem to be contra-indicated. In the section on blood diseases two interesting tables are given; one shows how the advance of polycythæmia vera can be controlled by short courses of acetylphenylhydrazine, and the other the remarkable effects of splenectomy on thrombocytopenic purpura. Especially good is the section on ductless glands, particularly the part dealing with diabetes; the table of caloric requirements for males and females for all ages should be of great assistance to those not accustomed to treating this disease. The paragraph headed "points in the training of patients" is well worth study. In discussing the uses of iodine in thyroid conditions, Dr. Campbell says: "It has at least the authority of antiquity, for well-authenticated Chinese writings about the years 1567 to 1573 show clearly that extracts of seaweed and burnt sponges (which contain considerable quantities of iodine) were regarded as specific in the treatment of goitre."

This book will be found of high value by practitioners and deserves a wide public.

BIOLOGICAL PRINCIPLES.

By J. H. WOODGER, B.Sc., Reader in Biology in the University of London. London: Kegan Paul, Trench, Trübner, and Co., Ltd. Pp. 498. 21*s*.

WHETHER working biologists are likely to possess the equipment for the digestion of Mr. Woodger's book may be doubted, but anyone who has had misgivings about the method of thinking, let alone the loose use of terms, will be grateful to the author for his profound and tenacious study of the logical basis of biological principles. Ordinary working biologists, even those who care to think upon the principles of evolution from the quasi-philosophical point of view, may be overwhelmed by the metaphysical introductory chapter and the long discussion of phenomenalism. But all who know the controversy which waged over the analysis of sensation since the time of Ernst Mach's famous book will realise that these epistemological discussions are necessary foundations for the establishment of a firm science of biological principles. Further, an analysis of things that happen is essential to an understanding of biological events; hence the chapter on Cause and Substance. Biological matters are only directly considered when the vitalistic and mechanistic theories are discussed, and this conducts the author into the analysis of the biological theory of organism, preformation, and epigenesis, and thence to teleology. In short, Mr. Woodger finds that the related matters of biology fall into groups: whole organisms; organic parts; environmental constituents; and the important types of relationship are: (1) spatio-temporal; (2) causal; (3) genetic; (4) organic or teleological. To all his long discussions the author brings acute critical powers which are admirably applied to an analysis of the important views of Whitehead and Schaxel, amongst the philosophic methodologists of the organism, and Wilson, amongst the pure biologists.

This work is a philosophic treatise of considerable length—perhaps of too great a length—but which no thoughtful biologist can afford to neglect if he cares for method as well as for collecting the bewildering facts of life.

THÉRAPEUTIQUE PHARMACOLOGIE ET MATIÈRE MÉDICALE.

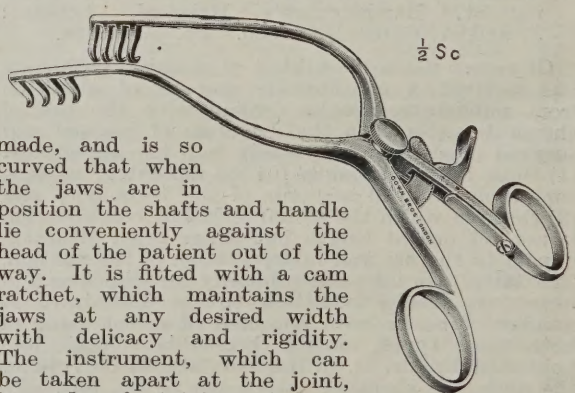
Par le Dr. FRANÇOIS ARNAUD, Professeur honoraire à l'École de Médecine de Marseille, Médecin Consultant des Hôpitaux. Paris: Masson et Cie. 1930. Pp. 878. Fr.95.

Prof. Arnaud holds that the therapeutical equipment of the average young graduate is inadequate, and that there is room for considerable improvement in the teaching of therapeutics. This view is held by teachers in many other countries and is attributed to various causes; in France, according to Dr. Arnaud, it is due to the fact that there is no systematic teaching of pharmacology and therapeutics in the third or fourth year of medical study. He himself gives a course of instruction to senior students and on this course he has founded his book. In the first part he considers general principles, and deals with the absorption and elimination of drugs, the factors modifying their action, and prescription writing. The rest of the work is devoted to a discussion of the action and uses of individual drugs, which the author has classified into five groups. The first consists of those agents which modify infections, and includes immune sera, vaccines, general antiseptics, and specific medicaments, such as quinine, mercury, and the organic arsenical compounds. The second consists of agents which excite or depress the nervous system, while the third, fourth, and fifth deal respectively with drugs which act chiefly on the circulation, the secretions and excretions, and general nutrition. The classification is sound enough from the practical point of view though, as the author recognises, it is vulnerable on other grounds. The book as a whole provides a good account of pharmacology by one who has had great experience in the application of the subject to the practice of medicine.

New Inventions.

A MASTOID WOUND RETRACTOR.

THE illustration shows a simple self-retaining mastoid wound retractor which has proved itself most satisfactory in use. It is lightly but strongly



made, and is so curved that when the jaws are in position the shafts and handle lie conveniently against the head of the patient out of the way. It is fitted with a cam ratchet, which maintains the jaws at any desired width with delicacy and rigidity. The instrument, which can be taken apart at the joint, is made of stainless steel so as to withstand repeated sterilisations without damage.

The retractor was made to my design by Messrs. Down Bros., Ltd., 21 and 23, St. Thomas's-street, London, S.E.

W. M. MOLLISON, M.Chir. Camb., F.R.C.S. Eng.

THE LANCET.

LONDON: SATURDAY, JUNE 28, 1930.

THE FOURTH DIMENSION IN NEUROLOGY.

THERE seems always to be a latent interval between the discovery of a new scientific principle and its passage into the general currency of thought. Both FREUD'S psychological concepts and EINSTEIN'S theories of relativity had been promulgated for a number of years before they suddenly became topics of dinner-table conversation. There is a summation of stimuli in the reception of ideas as in the perception of sensations. The principle of chronaxy, which as far as the medical world is concerned is still in its latent period, may prove to have a far-reaching influence upon neurological thought. Much interest therefore was aroused by a meeting of the Physiological Society last week at which Prof. L. LAPICQUE, the originator of the conception of chronaxy, Dr. GEORGES BOURGUIGNON, and some of their collaborators expounded their ideas and demonstrated their methods before an English audience. The conception of chronaxy, though at first sight somewhat complex, is based upon a fairly simple relationship between the duration and the intensity of a stimulus. Let us consider an electrical stimulus to a motor nerve. That such a stimulus must have a certain minimal intensity if it is to be effective seems obvious. It is less obvious but equally true that it must have a minimal duration. Stimuli shorter than this minimal duration are ineffective however intense they may be. As the duration of the stimulus is increased beyond its minimal length, the intensity required for its effectiveness diminishes. In other words, the shorter the stimulus the more intense it must be to produce a response. There is a limit, however, to the extent to which prolonging the stimulus enables its intensity to be reduced—that is, there is a minimal intensity below which no stimulus is effective however prolonged. Chronaxy is the measure of the relation between the duration and the intensity of a stimulus. It is taken as the minimal duration at which a current of double the minimal intensity is effective, the somewhat confusing doubling of the latter figure being necessary for technical reasons. An analogy may help to make the meaning of chronaxy clear. Let us picture the production of a response to a stimulus in a nerve as akin to the heaping of a certain quantity of earth in a sieve. To achieve this it is clearly necessary that the inflow shall exceed the outflow. If the time allowed be too short, the task cannot be carried out, however large the shovel, because there is not time to carry the shovel to the sieve. A minimal time is therefore necessary. The longer the time allowed, the smaller the shovel with which the task can be accomplished, but if the shovel be too small, no time will be long enough, because the outflow will exceed the inflow. There is therefore a minimal shovel. The chronaxy of this proceeding would be the least time in which the task could be carried out with a shovel twice the minimal size.

Let us turn now to the applications, actual and potential, of the principle of chronaxy. It has been found that there are differences of chronaxy between different nerves and between different muscles, and that chronaxy is modified by drugs and by pathological states. Normally a motor nerve and the muscles it supplies possess the same chronaxy, and this harmony or isochrony is necessary for the normal contraction of the muscles in response to impulses reaching them by way of the nerve. Curare increases the chronaxy of the muscles without influencing that of the nerves and muscular paralysis is the result. On the other hand, as BOURGUIGNON and HALDANE have shown, in tetany produced by hyperpnœa the chronaxy of the nerves is increased more than three times that of the muscles. Characteristic changes in the chronaxy of the muscles are found after lesions of the peripheral nerves and are of diagnostic and prognostic value. LAPICQUE claims that muscles differ in chronaxy according to their functions, and that muscles which contract synergically in effecting a movement always possess the same chronaxy. BOURGUIGNON believes that there exists a harmony between the chronaxy of the sensory and motor nerves supplying the same region of the body and has used this regional isochrony in the interpretation of reflex action. Thus he regards the normal flexor plantar reflex as due to the fact that the muscles which take part in it possess the same chronaxy as the nerves stimulated. Reflex action is thus akin to resonance. BOURGUIGNON also interprets in this way reflexes in which the motor response occurs in a region remote from that stimulated. An example is the palm-chin reflex of MARINESCO and RADOVICI, in which scratching the thenar eminence evokes a contraction of the muscles of the chin. The sensory and motor nerves and muscles concerned in this reflex possess the same chronaxy. The extensor plantar response is held to be associated with a breakdown of the isochrony upon which the normal flexor response depends, and the substitution of an abnormal isochrony linking the sensory fibres of the sciatic nerve with the extensors of the toes. This is at first sight a very different conception of reflex action from that which has been developed by English physiology and neurology, but the two views are not essentially incompatible. In living organisms there are many levels of explanation for the same phenomenon. We can consider reflex action in terms of the anatomical paths of the nerve-fibres concerned, in terms of their physiological relationships, and in terms of the biological purpose of the reflex for the organism. These explanations are mutually supplementary and not mutually exclusive. It may well be true that changes in reflexes are associated with alterations of chronaxy in the nerves and muscles concerned, but such metachronosis may be concomitant rather than causative. Moreover, the change of chronaxy which is held accountable for the extensor plantar response would be antagonistic to the extensor hypertonia which is the predominant reflex sequel of hemiplegia in the lower limb. This difficulty shows that the interpretation of changes of chronaxy is by no means easy and requires to take account of older and equally valid conceptions of neural activity.

When we transfer the conception of chronaxy from the peripheral nerve to the central nervous system we enter, as Prof. LAPICQUE admits, the realm of hypothesis. We cannot at present study directly the chronaxy of the intercalated neurones of the reflex arc. It may be freely admitted, however, that if, as seems probable, chronaxy is a property of all excitable tissue it may play an important part in the functions

of the central nervous system. For it renders possible what may be called a physiological resonance of the neurones which permits both a greater multiplicity and a greater delicacy of neuronal relationships than is conceivable on any purely anatomical basis. The assonance and variation of rhythms offer almost infinite possibilities of coördination with a limited structural linkage. Prof. LAPICQUE'S hypothesis of chronaxy-switching may illuminate many problems of inhibition, excitation, and integration. It is worth while in conclusion to examine the deeper implications of the physiological doctrine that the duration of a stimulus is as important a factor in its effectiveness as its intensity. As we have seen, a more prolonged but less intense stimulus can produce the same effect as a less prolonged but more intense one—namely, a minimal excitation of the nerve. As far as we can judge, therefore, the peripheral nerve is within limits indifferent to the ratio of intensity and duration in the stimulus. In other words, at that elementary sensory level from which we derive the raw material of consciousness, time and space are, within limits, indistinguishable. To trace the implications of this fact would take us too far from our subject. It means, however, that all vital activity, including consciousness, is essentially four-dimensional. Current biological and physiological concepts are three-dimensional. The resulting discrepancy is responsible for many philosophical problems, especially in the realm of perception. Chronaxy foreshadows a four-dimensional philosophy of the organism.

A SURVEY OF MEDICAL EDUCATION IN EUROPE.

A GROUP of well-known American and Canadian authorities have been studying the pattern of medical education in Europe, or rather in certain European countries, and the various social problems related thereto. They have now made a report, for which Dr. WILLARD C. RAPPLEYE, acting as "director of study" for an informal commission, is responsible, and it is a valuable document, which though partial in scope is impartial in judgment, and takes note of the things that matter. We obtain a detailed summary of the medical curriculum in this country, and a scrutiny of instructional courses in Germany and France which are not so full, but this is accounted for partly (and certainly) by the complicated story which British medical education presents, and partly (and probably) because an underlying sentiment of the commission is a desire for medical reciprocity between the English-speaking powers. Brief notes are added on the professional courses compulsory for medical students in Austria, Switzerland, the Netherlands, Denmark, and Sweden, and following these chapters we have a note on post-graduate education in Europe generally where the organisation in Denmark is fully treated. There is next an inquiry into the general aspects of medical practice in Europe in connexion with sickness insurance, which is succeeded by a valuable appendix where we find a list of the institutions and university faculties in the different countries which are able to grant medical qualifications. In the case of Great Britain the statistical information as to the average length of the curriculum, the broad results of examination, and the total expenditures by the schools upon the students is lucidly expressed and will furnish common ground for discussion between this country and America when questions of coöperation are on the tapis. All this information is compressed into a readable document of some 200 pages, and such rigorous exclusion of all but necessary matter has been practised with due proportion under the various headings. The report, though intended for the information of American authorities, can be read with extreme advantage by all interested in the problems of medical education.

The position in Great Britain is put out with remarkable clearness in an essay which comprises rather more than a quarter of the volume. A correct historical résumé of the development of the medical schools notes their primary association with voluntary hospitals and their increasing connexion with universities. This is an important observation, being an indication of practical rapprochement between the educational system of this country and America, where the great medical schools practically represent the work of the medical faculty of a university, the hospitals thus being wholly, or partly, the workshops of that faculty—a bald but mainly accurate description. Follows an exposition of the duties and responsibilities of, and the services rendered to the public by, the General Medical Council; this would make instructive reading for many publicists in this country whose criticisms of the Council, both with voice and pen, are too often forcible in proportion to their inaccuracy. The facts here can be found in the prefatory reading attached to the Medical Register, in the volume recently published from this office, entitled the "Conduct of Practice," and, for the most part, in the yearly educational numbers of THE LANCET, but the running comments of Dr. RAPPLEYE upon the career of the British student are informing to us all, inasmuch as he is led to stress certain aspects of the British medical curriculum which we take so much for granted that they seldom receive notice. Speaking of the elaborate system of examinations by which entrance to the medical profession is hedged about in this country, he alludes to the system as "a national industry"; and, drawing attention to the numbers of those who pass and those who fail at the numerous tests imposed by the qualifying bodies, he comments on the waste of time that is thus implied. He attributes these lamentable figures to two reasons, working throughout the course—namely, the absence of any arbitrary limitation to the number of students, followed by a similar absence of machinery under which a student can be removed from a medical school upon evidence of unfitness for the profession which he is striving to enter. Here, again, we have a reflection of fundamental importance to those who are working for an effective union between the medical professions of America and Great Britain.

It is with the possibility in view of such a union that this report becomes of topical interest to British educationists. The American "director of study," in scrupulously fair terms—indeed without a word of cavil—sets out the evils of examination; and those who know the framework of medical education in the best centres of the United States could point to the risks which are run by educational authorities when, in dispensing with external examiners, reliance is placed, for the standardisation of the medical students, upon the opinions of those engaged in teaching the candidates. The report finds in the British admission to the students' ranks of all and any who can comply with preliminary tests the cause of recurrent failures in examinations, and to some extent this is true. But those who are familiar with the drastic methods of weeding out that have to be practised in the medical schools in America so as to ensure that the classes of students, as they receive their training, present a common pattern of progress, will see no difference

in the plight of the rejected students; while the waste of time in dealing with unsuitable material has occurred before the sentences of banishment are pronounced. Progress lies between too much examination and too little examination—and this is alike the essential message of a clear and simple report, and a question of importance to America and Great Britain and to the other countries which have fallen under the notice of the commission. For those who regard union between the medical professions of each nation as a vital factor in the development of international amenities, it is satisfactory to hold that between the great English-speaking countries it is a matter not of principle but of degree, that calls for adjustment, when a fusion of interests can be secured.

PAPILLOMA AND CARCINOMA.

THERE are three main aspects of the cancer problem: a clinical or diagnostic, a surgical or therapeutic, and a biological, which concerns causation. It is for his work on the second of these that the name of SAMPSON HANDLEY will be lastingly remembered, since by his classical researches on the paths of dissemination he placed the surgical treatment of cancer upon a more scientific foundation—a foundation which is not likely to be shaken until we can dispense with mechanical methods of destroying malignant tumours. In the ninth of his Hunterian lectures, which we publish in our present issue, Mr. HANDLEY definitely passes to a consideration of ætiological factors and enunciates a new theory, which by reason of its extreme simplicity is bound to arouse universal interest and, as he has doubtless foreseen, not a little criticism. On page 1389 he says :—

"Any given consequence such as cancer springs from a chain of previous events stretching back to infinity, and not from a single cause. But if among those events one can be detected which for a given consequence is very frequently present, and has never been proved absent, the clue to the problem of causation has been obtained, and this event may be provisionally and loosely spoken of as the cause. In this sense I am bold enough to claim than lymphatic obstruction is the cause of cancer, though the labours of generations may be required to trace the intermediate steps."

The claim is, indeed, a bold one, and coming from any other pen might receive scant consideration. Examination of the steps that have led him to form the theory is not—at least at first sight—very convincing. It is claimed, for instance, that "papillomatosis precedes every variety of carcinoma," and when this quotation is taken out of its context it is one which the dermatologist—who has the most frequent opportunity of studying malignant neoplasms of all kinds in their earliest stages—will find it hard to accept. Quite early in the argument we are dogmatically informed that internal warts are much more common and much more important than those of cutaneous origin. The second assertion may be correct, but every skin department demonstrates the extreme frequency of verruca vulgaris among the dermatoses and infections of the epidermis and, what is of great importance in this connexion, their complete immunity, independent of their duration, from malignant change. What may possibly apply to papillomata in ducts cannot with any regard for truth be applied to the surface variety. Mr. HANDLEY might find the laryngologists equally opposed to the statement that "it is the rule for laryngeal cancer to begin as a papilloma." The Emperor Frederick's case which he quotes was the basis of an international inquiry, inaugurated by the *Central Blatt* in 1888, to determine whether benign laryngeal growths could become malignant or be so converted by intralaryngeal operations. Of 2531 cases in the first category only 12 (one in 211) were asserted by their reporters to have become malignant, and in the second, which included no less than 8216 intralaryngeal operations, 33 (one in 249), were presumed to have taken on a cancerous tendency as a result of operative irritation. Though figures are notoriously misleading, the view that papillomatosis precedes every variety of carcinoma will not be readily accepted in face of such cumulative evidence.

If credence be given to the second part of the theory even greater difficulties seem likely to arise, for it is claimed that lymphatic obstruction—the first stage of, and quite possibly a factor in, the production of the duct papilloma—is the cause of cancer. In support of this contention the lecturer gives a detailed and interesting account of the lymphatic supply of the skin, and follows it with his observations on the origin of lupus carcinoma, from whose study originated his theory of lymphatic ætiology. The hypothesis is applied to the genesis of tar cancers, and even to those which have their origin in moles and nævi. But if lymphatic obstruction in its ordinary sense is a factor in the production of cancer, then why does not the disease arise more commonly from chronic ulcers of the leg, with which lymphatic obstruction is so often associated? And why are there no premonitory symptoms suggesting lymphatic obstruction in squamous epitheliomata and rodent ulcers originating in such delicate structures as the eyelid? It is curious, too, that Mr. SAMPSON HANDLEY passes so rapidly over the results of the experimental investigation of cancer. Here the "absences of the relationship between papilloma and carcinoma" on which Mr. HANDLEY relies finds a simple explanation. According to the published work the appearance of a carcinoma after tar painting is not necessarily preceded by that of a papilloma.. When an area of skin is subjected to chronic irritation by tar painting a carcinoma may arise either alone or together with a papilloma, or a papilloma may appear first at the base of which a carcinoma arises subsequently. Papilloma and carcinoma have, therefore, a close relationship because they have the same ætiology of chronic irritation. The appearance in man of a papilloma in a tissue or organ indicates, therefore, that the tissue and organ may have been subjected to chronic irritation, and this in itself accounts for the subsequent appearance of a carcinoma.

These are some of the objections which are instinctively provoked by Mr. HANDLEY'S arguments, and in their turn are open to confutation. Meanwhile, his lecture should receive the careful consideration of those who have found their life-work in the study of cancer.

A COURSE IN RADIUM.

THERE have long been centres in this country at which individuals have done notable work with radium in one form or another, but hitherto students requiring a comprehensive course of study have resorted to Paris or Stockholm. The want is now to be filled by setting up a National Post-graduate School of Radiotherapy in London. Not long ago Mount Vernon Hospital obtained its enabling Act to investigate and treat cancer, and the Radium Commission, charged with the distribution of relatively large quantities of radium, encouraged the hospital and the Radium Institute to collaborate on a common basis

in the foundation of a school. Inasmuch as Mount Vernon is primarily a hospital for the treatment of cancer, the affiliation would become void should radiotherapy for cancer be abandoned. A scientific advisory committee, of which Sir Thomas Horder is chairman and Dr. Malcolm Donaldson honorary secretary, which was established to control treatment and research at Mount Vernon Hospital, has been accepted in that capacity by the Radium Institute; Sir Cuthbert Wallace will act as director of medical services for both places, and the school will be managed by a joint committee. Lectures will be delivered at the Institute in Ridinghouse-street, where the out-patient and follow-up departments will be located, together with a certain number of in-patients, but the bulk of the clinical teaching on in-patients will be done in the hospital at Northwood. At the instance of the Radium Commission, which is anxious that the teaching should be started as soon as possible, a course of one month's duration has been arranged to begin on Oct. 6th. This course will be given by the teachers in the two institutions and by others with special knowledge of radiotherapy. For example, Mr. Rock Carling will demonstrate the radium bomb at the Westminster Hospital annexe and the treatment of special regions will include demonstrations by Mr. W. D. Harmer on the larynx and antrum. On five mornings in each week of the course there will be attendance at out-patient practice. Later in the morning lectures and demonstrations will be given on the physical aspect of radium therapy, and on principles of treatment, including the methods of radiation and susceptibility of cells to different wave-lengths. Special teaching will be given by Sir Charles Gordon-Watson on the rectum, Mr. Stanford Cade on the tongue and pharynx, Mr. Geoffrey Keynes on the breast and œsophagus, Dr. Donaldson on the uterus, Prof. S. Russ on physics, Dr. J. C. Mottram on experimental pathology, and Dr. Philip Gosse and Dr. W. R. Ward on surface radiation. On three afternoons there will be ward rounds at Northwood. The details of the scheme will be circulated later and it is intended that the course itself shall be repeated periodically. Mount Vernon Hospital is appealing to the public for its assistance in equipping the hospital to be partner in a school of this magnitude. The new wing of the hospital, when complete, will bring up the number of beds from 150 to 250 and the projected X ray department will enable another form of treatment to be compared in efficiency with radium.

ROYAL MEDICAL BENEVOLENT FUND SOCIETY OF IRELAND.—The report of this Fund for 1929 presented at the annual meeting held last week in the Royal College of Surgeons, Dublin, shows that during the year a sum of £2104 was disbursed in grants to seven medical men, and 13 orphans and 63 widows of medical men, the average amount of grant being less than £24 10s. "Small as this grant is," writes our Dublin correspondent, "there is no doubt that in many cases it stands in the way of utter need. The subscriptions do not show any falling-off, but they are far less than they ought to be. Every medical practitioner in Ireland—some 4000—might readily subscribe £1 at least to the Fund. None knows to what needs he or his immediate dependents may be brought. From some counties a generous return comes, from others there is nothing, and from the whole City and County of Cork there is a single guinea! In each county there is a branch honorary secretary, but it would be fairer to the Fund and to its unfortunate beneficiaries if these secretaries who are unwilling to do any work would resign their offices and give the committees an opportunity of appointing more active workers."

Annotations.

"Ne quid nimis."

MEDICAL SERVICE IN INDIA.

THE absence of direct reference to medicine or to the health of India in the second volume[1] of the Simon Report, which appeared on Tuesday, can hardly fail to strike those who realise the part which the medical services have played, but there is a frank recognition that the problem of internal security is not a matter only of the preservation of law and order. The spread of epidemics, such as plague, in India is only prevented by constant vigilance on the part of the authorities, and it is laid down on an early page of the report that the life of millions in India depends literally on the existence of a thoroughly efficient administrative system. There must be in India a power which can step in and save the situation before it is too late. The principle, that during the period in which India is progressing on the road to complete self-government full provision must be made for the maintenance and efficiency of the fundamentals of government, applies with the utmost urgency to the securing of health. The Statutory Commission assumes that no change will be made in the position of existing members of any All-India services, and that the rights and privileges which they have at present will be safeguarded. The Commissioners see no reason why a career in the services should not under the new constitution provide ample interest and opportunity for men of brains and character, but, they add, "we cannot ensure this," and they recommend that retirement on proportionate pension should remain open without limit of time, although they believe that the majority of officers will be prepared to remain, providing this right is secured. At the present juncture India cannot afford to lose experienced men; it is recognised that European officers lay great stress on the continued provision for themselves and their families of medical treatment by European doctors. This the Commissioners regard as essential, and they recommend that no change should be made in the present rule (Devolution Rule 12) which gives the Secretary of State in Council power to prescribe the number of Indian Medical Service officers to be employed in the provinces, as well as the appointments and conditions under which they shall be employed. No effort, it is added, should be spared to secure an adequate number of European recruits for the Indian Medical Service to implement this fundamental obligation.

THE HUNTERIAN MUSEUM.

Sir Arthur Keith's annual report on the museum of the Royal College of Surgeons of England outlines a scheme of scientific research which will enable the museum to take its proper place in the advancement of science. Some of the rooms in the College have been converted into laboratories, and several new rooms have been built and equipped for research-work of a kind appropriate to the ordinary working of a museum. Through the efforts of its President, Lord Moynihan, the College is now in a position to award scholarships, three of which, bearing the names of Beaverbrook, Melchett, and Bernhard Baron, will be available at an early date, and will yield their holders £500 per annum. To a limited extent research has always been carried on at the Hunterian Museum, but it can hardly be said to have been recognised as one of its normal functions. The new scheme gives promise of fruitful investigations, the results of which will be embodied in the published transactions of the museum. Those who visit Lincoln's Inn between July 3rd and 26th, when the

[1] Report of the Indian Statutory Commission. Vol. II. Recommendations. H.M. Stationery Office. 3s.

additions to the museum will be on view, will have the opportunity of examining many instructive specimens, several of them of unusual interest. Details of these are given in the report of Mr. Cecil Beadles, the pathological curator; they include the series of tumours of the testicle, which formed the subject of the Jacksonian Prize for 1923, specimens of torsion of the testicle, chimney-sweep's cancer, cancer of the hand arising in a chronic tuberculous ulcer, unusual tumours of the brain and nerves, a remarkable specimen of congenital disease of the bones leading to hyperostosis and osteomata of various parts of the skeleton described by Dr. J. H. Sheldon,[1] an unusual form of calcifying sarcoma of bone presented by Mr. J. E. Schofield, and a unique specimen of multiple melanotic sarcomas in the liver of a child, the disease having been transmitted from a primary growth in the mother through deposits in the placenta. This specimen was presented by Dr. Parkes Weber, who is known to possess a particular genius for acquiring remarkable specimens; he has also presented a fine example of generalised osteosclerosis secondary to carcinoma of the prostate. Other notable specimens illustrate ossification in the scar tissue around a gastro-enterostomy opening, composite odontoma of the jaw, hookworm disease, and torsion of an appendix epiploica. Special mention should be made of a series of prehistoric Peruvian skulls with trephine openings, which demonstrate the very perfect results obtained by those primitive surgeons.

THE GERSON DIET FOR TUBERCULOSIS.

SOME months ago we gave a preliminary account[2] on the new Gerson diet for tuberculosis which is attracting much attention in Germany. Briefly it aims at: (1) limitation of mineral salts; (2) reduction of the proportion of carbohydrate in the diet; and (3) addition of raw foods containing vitamins. It is based on the theory that removal of salt from the food tends to dry up the tissues—a process which is considered to be essential to the healing of many so-called exudative processes. The carbohydrate components of food are reduced on the assumption that carbohydrates encourage catarrhal infections, while proteins, fats, and lipoids raise resistance. A total energy value of 3000 calories—derived from protein 90 g., fat 160 g., and carbohydrate 220 g.—is considered the standard. The treatment has been most extensively used by Prof. F. Sauerbruch and his assistant, Dr. A. Hermannsdorfer, chiefly in the treatment of lupus and of bone and joint tuberculosis, and the results in lupus are said to be exceptionally good. H. Rieckenburg,[3] however, finds that the inconvenience of cooking in a private house, the expense, and possibly the monotony of the diet make it hard to persuade private patients to persevere. He also points out that the conditions of the Gerson diet are, to some extent, fulfilled in the feeding of cattle, but this does not result in their immunity from tuberculosis. C. Pöhlmann[4] records a series of cases of pulmonary tuberculosis which were treated for three to four months on the Gerson diet; 33 cases were treated, all of them having open pulmonary lesions, and they showed an increase of weight over control cases. They also showed a slight improvement in physical signs, with less cough and sputum, and reduction of temperature, and, on the whole, offered a better prognosis than normally treated cases. In two papers by M. Gerson and A. Bacmeister[5] the combination of the Gerson diet with phosphorised cod-liver oil in the treatment of tuberculosis is discussed. Gerson himself describes the dietary in detail, giving a long list of foods which may be used. E. Mayer and I. N. Kugelmass, in reporting[6] a group of 30 selected patients, give a sample diet for one day. This diet, which has a calorific value of 3500, is as follows:—

7 A.M.: Oatmeal, 1⅞ oz.; sugar, ½ oz.; cream, 1 oz. 8 A.M.: Br. tomatoes, 3½ oz.; stale bread, 1 oz.; sweet butter, ⅔ oz.; cream cheese, ½ oz.; honey, ½ oz.; milk, 8 oz. 11 A.M.: Lemon juice, 4 oz.; sugar, 1 oz.; egg yolk, ⅔ oz.; butter, ½ oz.; crackers, ½ oz. 1 P.M.: Veg. soup, 8 oz.; potato, 5 oz.; peas, 3⅓ oz.; carrots, 3½ oz.; lettuce, 1⅔ oz.; mayonnaise, ½ oz.; bread, 1 oz.; butter, ⅔ oz.; milk, 8 oz.; 4 P.M.: Cocoa, 8 oz.; bread, 1 oz.; butter, ½ oz. 6 P.M.: Rice, 1 oz.; lettuce, 1⅔ oz.; cheese, ½ oz.; bread, 1 oz.; butter, ½ oz.; milk, 8 oz. 8 P.M.: Oatmeal, 1⅔ oz.; sugar, ½ oz.; cream, 1½ oz.; almonds, ½ oz. In addition, the patient receives one tablespoon of cod-liver oil three times daily, much fruit between meals, and about five grammes of meat weekly.

According to Gerson the foods which should be strictly avoided are: common salt, all kinds of preserves, smoked or spiced meat, smoked or salted fish, vegetable soup, cheese, vinegar, bacon, ham, sausage, cocoa, chocolate, cake, strong tea and coffee, and alcohol. The list raises doubt whether the good results reported may not be due to correction of national errors in diet. The difficulty of the treatment appears to be that special skill is required for cooking the salt-free diet, so that it can only be adequately provided in an institution. The fact that all foods must be fresh, and that salt must not be used in preparation, are no small drawbacks in these days of urban life, and in some German hospitals—e.g., in Berlin and Munich—special kitchens have now been installed.

[1] Brit. Jour. of Surg., 1929, xvi., 405.
[2] THE LANCET, 1929, ii., 617.
[3] Deut. med. Woch., May 2nd, p. 746.
[4] Münch. med. Woch., April 25th, p. 706.
[5] Deut. med. Woch., March 21st, pp. 478 and 480.
[6] Jour. Amer. Med. Assoc., 1929, xciii., 1856.

SCIENCE AND PHILOSOPHY.

"A PHILOSOPHY," as Mr. Wilfred Trotter says in an interesting letter in the current number of *Nature*, "is an attempt to bring into harmony the verifiable truth of science and the intuitive truth of the mind." The philosophers recognise no bounds to the subjects with which they concern themselves. But scientists are divided more or less sharply into two groups by their views on the proper relationships between verifiable and intuitive truth. One group holds that science is concerned only with what is capable of objective proof and that therefore science and philosophy can have no profitable contact. The pursuit of natural knowledge by observation and experiment arose indeed as a protest against a general faith in the efficacy of tradition and intuition, and to admit intuition once again as a valid method of ascertaining truth is to betray the main position which natural science has slowly won for itself. Sir Peter Chalmers Mitchell in his Herbert Spencer lecture at Oxford recently put the case against imagination in science very strongly, and Mr. Morley Roberts in his layman's commentary on evolution and biological doctrine[1] speaks contemptuously of the attempts which are made "to raise futile hybrids from science and the verbal philosophies which are themselves the distorted offspring of orthodox religion"; it might almost be the hard hitting with which T. H. Huxley supported the same cause. On the other hand, there is a group which frankly recognises what to the ordinary man in the street is an obvious fact—that life contains a subjective element as well as a material basis. People like Prof. A. S. Eddington on the physical side and Prof. A. Meek on the biological side say that "explanations" of the world which exclude mind must necessarily be wrong because they are manifestly incomplete. This way of thinking not only sees nothing improper in a contact between science and philosophy but looks to such coöperation as a necessary condition for further progress. The same point of view is urged by Prof. F. G. Donnan in a letter to *Nature* of June 7th. He says there is urgent need that philosophers, psychologists, and scientists should get together to discuss the nature and meaning of science and its relation to philosophy and to our ordinary

[1] The Serpent's Fang. By Morley Roberts. London: Eveleigh Nash and Grayson. 1930. Pp. 263. 18s.

concepts of the familiar world. He would have poets come too to the international congresses which are his definite proposal. Mr. Trotter lays more stress on the necessity of realising the implications of modern physiological discovery. It is, he points out for instance, an actual fact that the wish is father to the thought, and he twits the philosophers on generally coming to the conclusions which happen to fit the convictions with which they started. What is the most striking feature of the whole discussion is the way in which the certainties of last century—the systems of philosophy, the dogmas of science—have been replaced by doubt and hesitation: "we know" has changed to "I wonder," and (with some exceptions) the philosopher takes note of scientific discoveries and the scientific worker talks with the philosopher. This must be for good, even if for a while no one knows quite where he is.

MITOGENETIC RAYS.

IN 1923 A. Gurwitsch showed that the growing root of an onion gave off something which could travel through air and stimulate the multiplication of cells in another onion root. The root of one onion was arranged vertically, the root of the other horizontally, and so aligned that its axis, if prolonged, would cut the vertical root at the growing point a little behind the tip of the root. After about three hours' exposure the vertical root is fixed and cut into serial sections; more mitoses are found in the half turned towards the horizontal root than in the half turned away from it. The distance between the two roots could be anything up to an inch or rather more, and the interposition of a plate of quartz did not prevent the effect. Gurwitsch supposed that this action at a distance is due to some sort of radiation given off by growing tissue, and it seems very likely that he is right. It has since been shown that a variety of tissues can originate the influence—young tadpoles, frog's blood, cultures of yeasts and of several species of bacteria, including *Bacterium tumefaciens* of Smith, which causes abnormal growths in plants which are supposed to be analogous to cancer. Malignant tumours have the same effect, as also has a contracting muscle. Fresh extracts of tissues may also give off the influence, and several workers have concluded that it arises in the processes of glycolysis or oxidation or both; it may, indeed, emerge from such a simple system as lævulose in alkaline solution and oxygen or glucose and permanganate. As detectors of the rays a number of different tissues have been used—plant roots, cultures of yeasts and bacteria, corneal epithelium, sea-u chin eggs—and many tissues which are capable of cellular multiplication could, no doubt, be adopted for the purpose. The rays will pass through quartz and a good deal of water; they are stopped by a fair thickness of glass or gelatin. By this method of analysis and by exploring the ultra-violet spectrum with proved detectors, Gurwitsch concludes that the effective rays are at about 2000, though others place them nearer 3000. What is remarkable is that no one seems to have been able to detect them by photography, or any other physical means.

Such are the main facts about "mitogenetic rays," and a useful summary will be found in the Bulletin of the Pasteur Institute.[1] There is not, of course, complete unanimity among those who have looked into the phenomenon, but so many workers have reproduced Gurwitsch's experiment in such a variety of different ways that one can hardly doubt its essential validity. The importance of the discovery is obvious if we consider only that it makes it no longer necessary to assume the passage of a tangible substance to explain the influence of one organism or tissue on another, nor to conclude from a failure to demonstrate such a substance that an influence does not exist; experiment, indeed, becomes more hazardous than usual. Under the heading of the ill-effects of undercrowding, for example, there are a series of curious facts which may find their common explanation in mitogenetic rays; drosophila does best with a certain concentration of flies in the breeding bottle, single cells will not give rise to successful tissue cultures, it is often difficult or impossible to start a culture with a single yeast or bacillus, and so on. Cells exert a favourable influence on one another, and it is no longer certain that this is due to a substance in the ordinary sense of the word for which a search may be made with some prospect of success. Similarly inside the body radiant influences may be at work in determining the due relationships of tissues to one another, and in enabling a carcinoma cell to induce malignancy in a contiguous connective tissue cell as sometimes happens. It will be exceedingly interesting to watch the further development of the problem.

[1] Bull. de l'Inst. Pasteur, 1930, xxviii., 393, 441.

A FOURTH VENEREAL DISEASE.

A DISEASE of the inguinal glands which was for long confused with other morbid conditions such as tubercle has recently been accepted as an infective malady dependent on venereal contagion. In France J. Nicolas, M. Favre, and F. Lebeuf have made extensive observations on this condition and in Berlin W. Frei has worked out its differential diagnosis. He believes it to originate in an erosion of the genital organs, comparable to gonorrhœa or the bubo of soft chancre. In favour of this hypothesis is the fact that the disease is only met with in persons who have reached the age of sexual maturity, while the history shows that at some time previously, generally from 10 to 30 days, they have had relations with suspected individuals. Even more remarkable is the fact that in an appreciable number of cases the disease occurred at the same time in a man and a woman who had had frequent sexual relations. Some authors have asserted that lymphogranulomatosis inguinale is an atypical form of glandular tuberculosis. Against this assertion is the inability of any observer to infect guinea-pigs with tubercle by inoculation of the material from the affected glands. In Italy, A. Clerici has recently drawn attention to a method of diagnosis by a cutaneous reaction.[1] The pus from one of the affected glands, which has softened but not yet burst, is used as an antigen. The pus is obtained by puncture, diluted with saline solution in the proportion of 1 to 5, and sterilised in a bain-marie for two hours at 60° C. the first day and for another hour on the day following. If an intradermal injection of this mixture is made on an individual suffering from lymphogranulomatosis inguinale in a developed stage, an intense papular dermatitis is developed which reaches its height in two days and lasts for several more days. If the injection is made on a healthy person, or on one suffering from a disease of the lymphatic glands of a different nature, such as ordinary suppurative adenitis, bubonic plague, leukæmic lymphoma, or bubo from soft chancre, there will be no reaction. The reaction often gives positive results in the so-called "climatic bubo," and on the other hand an antigen prepared from the pus of the climatic bubo, which is often met with in Sumatra and Chili, gives positive reaction in individuals suffering from lymphogranulomatosis inguinale. This leads one to suspect that these two diseases may have something in common, for although climatic bubo is mainly a tropical disease it also occurs in temperate zones, for example, Japan and Western Siberia and recently Berlin. Cantlie maintained that it was allied to pestis minor, while Castellani and Chalmers emphasised fundamental differences between climatic bubo and plague, both from pathological and histological points of view. G. Rost has expressed the opinion that climatic bubo is a venereal disease due to a micro-

[1] Gaz. d. osp. e d. clin., May 4th, p. 557.

organism which has its habitat in the vagina of native women. In testing the intradermal reaction as an aid to diagnosis, Nicolas, Favre, and Lebeuf [2] experimented with two varieties of antigen: (1) a glycerin extract prepared according to Pasteur's anti-rabies technique, and (2) that of the Frei type—diluted and warmed pus—already described. The former antigen gave positive results in 13 out of 14 patients suffering from lymphogranulomatosis inguinale, and in a syphilitic with an atypical inguinal adenitis and was negative in all other control subjects. The latter antigen used in six cases of lymphogranulomatosis inguinale was positive in all of them; moreover the two antigens used simultaneously gave positive results. Recently, H. Löhe and K. Blümmers [3] have pursued similar investigations and found the intradermal reaction positive in 13 cases of lymphogranulomatosis inguinale and negative in 50 cases of soft chancre. They failed to find any typical primary lesion apart from balanitis, and draw attention to the frequency of a general infection with fever and skin manifestations, and to the condition known as "esthiomenos," with occasionally a hypertrophic elephantiasis. Therapeutic measures consist in the administration of antimonial preparations, such as the tartrate, stibenyl, and neostibosan, but successful treatment by these means is slow and uncertain in its results. Surgical treatment by removal of the glandular foci is more rapid, but is often contra-indicated by the bad general condition of the patients.

THE STORAGE OF FOOD.

THE problems connected with the delivery to the consumer of food in the best possible condition continue to occupy the attention of the Food Investigation Board, which has recently issued its report [4] for the year 1929. The staff of the Board maintain cordial relations with those engaged in the various branches of the food industry to which the investigations relate. Not only are urgent problems in this way brought at once to the notice of those prepared to attempt their solution, but the results of any investigation can be communicated without delay to those engaged in the commercial undertakings involved. An example of this coöperation is related in an account of experiments carried out to determine the factors involved in preserving the appearance or bloom of frozen mutton and lamb. A series of lambs were slaughtered under supervision and their carcasses were allowed to hang for 18 hours. They were then covered with stockinette wraps and frozen at a temperature of −10° C. At the end of 24 hours one set of carcasses was wrapped in waxed paper to reproduce storage conditions of high humidity, while the others were left in their stockinette wraps. After this they were all stored for 18 weeks at a temperature of −9·7° C. at a relative humidity of 80–85 per cent. The carcasses were then sent to Smithfield for the opinion of the trade. Those wrapped in waxed paper had lost on an average 2·54 per cent. of their weight, while the others had lost 2·7 per cent. The trade was unanimously of the opinion that the bloom of the protected carcasses was perfect, while that of the others was definitely inferior, especially in the case of a subgroup which had been brought out of the cold store at intervals and allowed to sweat. This and similar experiments have proved that the strictest control over the temperature and air humidity at every stage during the storage and transport of frozen meat is necessary if a product of the best quality is to be obtained. The chemical composition of the surrounding atmosphere was found to be not without its effect on the appearance of meat stored at a low temperature. The red colour of fresh meat is due mainly to the hæmoglobin present in the muscle-fibres. In the presence of oxygen this hæmoglobin becomes slowly oxidised to the brown pigment methæmoglobin. Atmospheric oxygen penetrates the muscle-fibres to a depth of only one or two millimetres and it is only in this region that methæmoglobin can be formed. In atmospheres containing larger proportions of oxygen the depth of penetration is greater. The rate of methæmoglobin formation, however, does not depend directly on the amount or pressure of oxygen present, for it is found by experiment to be greatest when the pressure of oxygen is considerably less than that in air. Hence, with atmospheres containing high pressures of oxygen, rapid formation of methæmoglobin takes place not at the surface where the pressure is highest, but at some considerable distance from the surface, where the pressure is less. Meat exposed to such atmospheres might still have a red appearance superficially, the brown discoloration of the interior due to methæmoglobin formation not being visible from the surface. At 0° C. the rate of methæmoglobin formation is greatest when the concentration of oxygen in the atmosphere is only 0·5 per cent., or less than the concentration found in commercial nitrogen. It is pointed out, therefore, as an interesting theoretical fact, that in order to lessen superficial discoloration of stored meat by methæmoglobin, and therefore to increase its attractiveness, it would be better to keep the carcass in an atmosphere of pure oxygen rather than attempt to exclude oxygen by storing it in an atmosphere of nitrogen. It is readily appreciated that the various factors responsible for securing the storage of meat in the best possible condition are by no means easy to determine. Moreover, dairy produce, fruit, and vegetables all present equally intricate problems which are being energetically tackled. This type of investigation is not only yielding contributions to pure science, but offers the prospect of the provision of food of superior quality at relatively low prices.

[2] Jour. de Méd. de Lyon, May 20th, p. 295.
[3] Med. Klin., May 30th, p. 807.
[4] H.M. Stationery Office, London, 1930 2s. 6d.

IRRADIATION OF THE UTERUS.

A "multiple-area intra-uterine radium applicator" has been devised by Dr. William Brown [1] of Chicago, for the treatment of cases in which the uterine cavity is enlarged or distorted in conditions of hæmorrhage, malignant growths, polypi, endometritis, and fibroids. He claims that it provides more nearly uniform radiation of the corpus than the central uterine applicators, with tubes in tandem, which are commonly used in the leading radium clinics. The instrument is arranged to use in the uterus one, two, or three radium tubes which are commonly 10 mm. long. The radium is placed inside a brass tube which is fixed at the end of a calibrated carrier. The carrier is attached to the radium by a short length of flexible clock spring material, the total length being 27 cm. After the cervix has been dilated, the uterine cavity is sounded and its length is determined. A central tube is then introduced into the vault, and the lateral tubes are applied, each being directed to one or other cornu. The three calibrated handles are then brought together and a carrier cylinder is slipped over them. At the cervical end of this cylinder there is a movable disc 3·2 cm. in diameter to which radium tubes can be attached; these rest against the portio and are fixed by a vaginal pack. Knowing the depth of the uterine cavity, the position of the radium tubes in the uterus can be determined by reading the calibration marks on the handles of the carriers. The position of the tubes can be altered during the course of the treatment without disturbing the perineal dressings, and in this way short radium tubes can be used for irradiation of the whole uterine cavity. The instrument in its present form does not recognise the need for placing radium applicators in the vagina as close as possible to the lateral walls of the pelvis in order to irradiate the parametria and obtain as wide cross-firing as possible for cases of cancer in the lower uterine

[1] Jour. Amer. Med. Assoc., May 10th, p. 1471.

segment. This defect is, however, easily remedied. Radiologists will welcome a device which permits more nearly uniform irradiation and which ensures the treatment of the cornu in cases of cancer of the corpus. The difficulty of applying radium tubes with precision through the narrow cervical canal has long been recognised. Brown's paper does not give the results of cases treated by the method, and no physicist will accept his statement that it gives homogeneous irradiation to the entire uterus and ovaries and any pathological condition that may be present. Nevertheless the technique is of much interest.

ADRENALIN AND HYPOGLYCÆMIA.

THE symptoms which follow an overdose of insulin have never been satisfactorily explained. Hypoglycæmia alone cannot be regarded as wholly responsible, for in some patients, especially in diabetics with unusually marked hyperglycæmia, the blood-sugar may be barely subnormal during "reactions." It is well known that insulin and adrenalin, when injected, have opposite effects on the blood-sugar. Some experiments by A. Norsted, A. Norgaard, and T. E. H. Thaysen [1] suggest that insulin injections stimulate the suprarenal medulla to increased secretion, and that the symptoms of "hypoglycæmia" are partly due to adrenalin. During hypoglycæmia induced by intravenous injections of insulin, these authors observe a rise in the systolic and a fall in the diastolic blood pressure, accompanied by acceleration of the pulse; these circulatory changes, which are certainly suggestive of an increased output of adrenalin, are most evident when the blood-sugar has reached its lowest point, and is about to rise again. They quote other experiments supporting their hypothesis. C. G. Sundberg and others claim that, after excision of the suprarenal, animals become more sensitive to insulin, and W. B. Cannon and his associates find that insulin fails to accelerate the heart beat in such animals. B. A. Honesay, S. T. Lewis, and E. A. Molinelli have connected the suprarenal vein of one dog with the jugular of another and have found that an insulin injection into the first dog is followed by a rise in the blood-sugar of the second. Furthermore, in Addison's disease, the blood-sugar is often subnormal. It is, of course, unnecessary to attempt to ascribe all the various manifestations of "hypoglycæmia" to excess of adrenalin; diplopia, aphasia, coma, and hemiplegia cannot be so lightly dismissed. There seems, however, little doubt that insulin injections do provoke, either directly or otherwise, a compensatory increase in adrenalin output, which is probably responsible for some of the symptoms which characterise an overdose of the former hormone. Such a conception helps to explain why "hypoglycæmic" reactions may occur when a high blood-sugar falls sharply, but not to the point of actual hypoglycæmia, in the literal sense of the term. It also furnishes an argument for abandoning as misleading the word "hypoglycæmia," although an alternative is difficult to find. "Hyperinsulinism," while being less committal, is clumsy and has, in any case, already been applied to cases of spontaneous overactivity of the β cells.

SEDIMENTATION TEST IN LEPROSY.

PRESENT knowledge of the sedimentation of red blood cells dates from the observation of Fahraeus that suspension-stability is decreased in all kinds of infection, especially those accompanied by high fever. Puxeddu (1924) first studied this phenomenon in leprosy and with others noted that the rate of sedimentation is increased in active cases whereas in nerve leprosy there is little departure from the normal. An excellent résumé of the results obtained with Rubino's reaction reaches us from Malaya.[2] For this test 1·0 c.cm. of leprosy serum is added to 1·0 c.cm. of specially prepared sheep cell suspension. The two are thoroughly mixed and then incubated for one hour at 37° C. With serum obtained from cases of leprosy, sedimentation is said to occur within half an hour, whereas many hours are needed to complete it with other sera. Marchoux and Caro reported 80 per cent. positive reactions in 800 lepers, using 0·2 c.cm. suspension in place of 1·0. Russell Amies employs an elaborate technique in the preparation of the sheep cell suspension, using a solution of 6 per cent. of formaldehyde at pH 7·4. The use of formolised sheep cells in place of the patient's own erythrocytes is a distinct advantage. The formaldehyde has the property of toughening the cell membrane, whilst the hæmoglobin is changed into methæmoglobin. The theory that the suspension-stability of the blood depends upon its albumin and globulin content is thus borne out by experiment and the sedimentation-rate becomes the index of the proportion of these two protein factors in the blood. But as the albumin-globulin ratio is altered in many pathological conditions, it is obvious that a diagnostic test based upon this ratio cannot be very reliable. A positive reaction was obtained in 89 out of 353 leper sera examined, while 16 positive results were recorded in a series of 287 sera obtained from a mixed assortment of diseases. A more minute analysis shows that a positive reaction is given only in those cases of leprosy in which the disease is active. All workers on leprosy are familiar with the difficulty of deciding whether it is safe to press treatment or whether it is necessary to go slowly for fear of bringing on a reaction. Experience shows that some information can be got from the Rubino test; a number of positive reactions were given by lepers who at the time their blood was taken appeared to be fairly inactive cases, but who whilst receiving fairly large doses of Alepol shortly afterwards developed severe leprous reactions. This suggested that a positive Rubino reaction contra-indicates intensive treatment with anti-leprotic drugs.

[1] Acta Med. Scand., 1930, lxxiii., 125.
[2] The Rubino Reaction in Leprosy. By C. Russell Amies, M.B. Bull. Inst. Med. Res., Federated Malay States, No. 4 of 1929.

MEDICAL CONGRESS AT BRUSSELS.—On June 28th the King and Queen of the Belgians are opening the Journées Médicales de Bruxelles, which this year celebrate the centenary of national independence. The congress will end on July 2nd.

HOSPITALS CONFERENCE AT NEWCASTLE.—A joint conference of the British Hospitals Association and the Incorporated Association of Hospital Officers was held at the Royal Victoria Infirmary, Newcastle-on-Tyne, from Wednesday to Friday of last week. In the absence of the President, Sir Arthur Stanley, Lord Armstrong presided. On the first day the conference created a fund, on the lines of King Edward's Fund for London, for the benefit of the provincial hospitals. The terms of the resolution were as follows:—

Inasmuch as the benefits of King Edward's Hospital Fund for London are limited to hospitals within the London area, the British Hospitals Association, as the representative association of those hospitals in Great Britain and Northern Ireland which are under voluntary management, is prepared to accept donations and legacies for distribution at the discretion of the Council among voluntary hospitals outside the London area. Donations and legacies may be allocated for distribution among hospitals in any defined regional area outside London. The association is also prepared to accept donations and legacies for furthering such of the general objects of the association as the council may from time to time think fit.

The Royal Automobile Club has started the fund with a donation of £800, and a request that the money shall be distributed among hospitals which have been most called upon to deal with the victims of road accidents. Subsequently Sir Robert Bolam read a paper on the Relations of Contributory Schemes to Hospitals and their Staffs, in which he expressed the opinion that the area scheme in connexion with hospitals was the only rational and economical one. Lord Cozens-Hardy followed with a paper on Hospital Contributory Schemes and their Problems. He admitted that a scheme which covered the whole country might be ideal, but argued that it would lose the great advantages which accrue from local interest in local institutions.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles Contributed by Invitation.

LXXVIII.

INTERPRETATION OF BLOOD FILMS.

Part II.*—The White Cells.

A detailed account of the varied white cell changes which may be present in the blood film is apt to be involved, but the diagnostic import of these changes can be assessed in a simple manner if they are considered mainly from the point of view of cell maturity. The white cell changes in the film can thus be considered a guide to the activity of the marrow and lymphoid tissues, and it becomes unnecessary to give a long list of disease syndromes with accounts of the blood changes which may accompany them. The red marrow and the lymphoid system can be regarded as tissues which respond to a variety of stimuli by passing out more or less mature cells into the circulation, the extent and nature of the transference varying directly with the extent of the stimulus. Thus in early acute inflammation the phagocytes of the peripheral blood are increased and tend to be less mature but otherwise normal cells. In myeloid leukæmia a blood film resembles a marrow film in the proportions and immaturity of the cells present.

It is not necessary to consider any more elaborate scheme of derivation of the white cells than can be established from the examination of the blood film in disease or the red marrow in health. The primitive mononuclear non-granular myeloblast can be regarded as the parent cell of all the white cells except the lymphocytes. The myelocyte is the more mature and now granular myeloblast, the type of granule, whether large or small, oxyphil or basophil, determines the type of mature leucocyte produced. The round myelocytic nucleus becomes first notched, then lobulated to form the adult cell, and, generally speaking, the more mature the leucocyte the more distinct and numerous are the lobules of its nucleus. The origin of the phagocytic large hyaline or large mononuclear cells is uncertain, but according to one view they are derived from the granular myelocyte with notched nucleus, the nucleus undergoing little further change and the neutrophil granules usually disappearing. The lymphocytes are derived from primitive lymphoblasts very similar in appearance to the myeloblasts, and develop into the small or large lymphocytes of the normal blood.

Differential Count.

The differential count of the white cells of the stained film gives one an approximate idea of the relative proportions of the various cells. The information is approximate, since it is unusual to count sufficient cells for an accurate ratio because of the considerable variations present in different normal individuals or in the same individual at different times. The normal percentages may be given as follows. The finely granular oxyphil or polymorphonuclear neutrophil 50–65, the eosinophil 1–3, the mast cell 0–1, the large hyaline or large mononuclear 3–6, the large and small lymphocytes 25–45. It should be observed that the polymorphonuclear neutrophils commonly comprise only about one-half the total number of white cells and that the small and large lymphocytes, taken together, may closely approach this proportion under normal conditions. In childhood the relative lymphocytosis often exceeds these figures. The high proportion of lymphocytes present in health is not so generally recognised as it might be, and figures within normal limits are often quoted as examples of a relative lymphocytosis.

Variations in the kind and in the relative numbers of the white cells afford valuable evidence in the stained film and may concern either the myelocytic or lymphocytic elements. Alterations in the total number of leucocytes can only be very approximately recognised in the film. The extreme leucopenia of aplastic anæmia or the leucocytosis of the leukæmias can, as a rule, be deduced with certainty from the number of white cells present per field of the microscope and from the proportion of white to red cells. The intermediate variations can only be hazarded, and any estimation of the actual number of leucocytes present is fallacious because of the uneven distribution of white and red cells in the great majority of film preparations.

Myelocytes.

Increase in the myelocytic white cells may be both absolute and relative, or less commonly only relative. It occurs in any inflammatory state associated with, or tending to be associated with, pus formation in any part of the body, and in these states the film usually provides more information than the total count. The blood picture varies in degree with the gravity of the clinical state. In the early stages of inflammation the phagocytic cells are absolutely and relatively increased, the polymorphonuclear neutrophils rising to 75 or 85 per cent. and the large hyalines to 5 or 10 per cent. The eosinophils are usually diminished or absent. If the condition progresses the changes become more pronounced and the cells affected tend to become less mature as shown by deficient lobulation of the nuclei, simple notching of the nucleus, the appearance of a few myelocytes, and even the occasional presence of a myeloblast. These changes, fluctuating with the clinical state, give some clue to the progress of the disease and can be estimated from the general appearance and description of the film.

Arneth Index: Granular Changes.

The nuclear immaturity of the polymorphonuclears can be numerically estimated and forms the basis of the Arneth index, obtained by counting the nuclear lobes. The so-called shift to the left of the index results from an increase in the immature cells with fewer lobes to their nuclei. Other but less evident changes in these cells have been observed in the granules, which in toxic or inflammatory conditions tend to become larger, more deeply staining, and less regularly distributed in the cell. This appearance is apparently the one which has attracted considerable notice in Germany recently and has tended to replace the Arneth index as a guide to the presence and progress of septic states and the granules in the cells have been considered to be fragmented bacteria or the debris of cells. Since a similar appearance is present in the few remaining polymorphonuclear neutrophil cells of an aplastic anæmia case both these suppositions would appear to be unlikely and the altered size, distribution, and staining reaction of the granules may simply be indications of the extra work thrown upon the cellular ferments. More serious changes, of bad prognosis, are the relative increase of the phagocytes without a leucocytosis, or even with a fall in total number. Most serious is the complete or almost complete disappearance of the phagocytic cells, a blood picture to which the name of agranulocytosis has been given and which is usually associated with an intense and commonly fatal angina of the throat.

Blood Changes in Myeloid Leukæmia.

One blood state may be mentioned in which an inflammatory leucocytosis is an almost constant feature—namely, primary erythræmia or Osler's disease. Films show crowded red cells with high hæmoglobin content, occasional normoblasts, and many polymorphonuclear and large hyaline cells. Chronic myeloid leukæmia provides in the film an exaggerated picture of the acute inflammatory state. Over 90 per cent. of the cells are myeloid, the majority being polymorphonuclear, myelocytes are numerous, and some 5–10 per cent. of myeloblasts are present. Mast

* Part I., on the Red Cells, appeared last week.

cells and to a less degree eosinophil cells are relatively and absolutely increased, and in addition red cell changes with normoblasts and megaloblasts are found. In acute myeloid leukæmia cellular development is arrested at the myeloblast stage, and as the fatal termination approaches the cell total falls until a state of actual leucopenia is reached. The eosinophil leucocyte requires special notice among the myeloid cells, since an increase above 5 per cent. has diagnostic significance. Eosinophilia is found in almost all widespread skin affections, including most of the specific fevers, in infection by animal parasites, and in certain other states of which spasmodic asthma is a well-known example. There is no general eosinophilia in Hodgkin's disease nor any blood changes of diagnostic value.

Changes following Carcinomatous Invasion of the Marrow.

It is probable that a leakage of marrow cells into the blood stream may occur under two other conditions which one may term mechanical. One of these has already been described—namely, the appearance of nucleated red cells and immature leucocytes in the film consequent upon carcinomatous invasion of the marrow. In the two last cases of proved myeloma at the London Hospital the blood films showed a normal picture with the addition of about 10 per cent. of large mononuclear non-granular cells of a primitive endothelial type which were thought to represent the actual marrow tumour cells.

Lymphocytes.

The lymphoid elements undergo alteration in the blood films in a degree somewhat similar to the myeloid. They are moderately increased in a variety of febrile states unaccompanied by suppuration as in the granulomata, tuberculosis, and syphilis, also in uncomplicated influenza and the enteric group of fevers. The increase is more relative than absolute, a decrease in the total number of leucocytes being usual and the more significant because the changes in the blood film are the exact opposite of those found in septic states. The lymphocytes are both relatively and absolutely increased in glandular fever and in certain infantile disorders, of which the most striking is whooping-cough, when the lymphocytosis is so extreme as to be of diagnostic importance. In glandular fever the lymphocytosis may be of short duration and may not appear until late in the disease. A relative increase of the lymphocytes accompanies a diminution of the myeloid elements in the early stages of aplastic anæmia, and in the final stages the few remaining leucocytes consist almost entirely of lymphocytes.

The greatest increase of lymphocytes met with occurs in the lymphatic leukæmias when the proportion of lymphoid to red cells equals that of the myeloid elements in myeloid leukæmia. The lymphocytes in leukæmia may be either large or small, the size of the cell having no prognostic significance, and are often atypical and occasionally difficult to distinguish from myeloblasts. The diagnosis of lymphatic leukæmia can in almost all cases be made from the film preparation alone.

Summary.

Leucocytic changes recognisable in the blood film are thus to be expected in some form or in some degree in almost every kind of diseased state; the nature of the change found in any morbid entity depends upon the kind of stimulus to the marrow and lymphoid tissues, the pyogenic infections calling for phagocytes, the granulomata for lymphoid cells, the animal parasites for eosinophils. The response of the hæmatopoietic system will be stronger if the stimulus is prolonged or intensified, strongest—but still of the same category—in those states of unknown ætiology which appear to affect the marrow and lymph glands directly and which we call the leukæmias.

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Special Articles.

FIBROSITIS.

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FIBROSITIS is an inflammation of the fibrous sheath and supporting structure of muscles and nerves, the ligaments of joints, fasciæ, and tendons.

Thickenings have been removed and examined microscopically by Stockman. Essentially it is the white fibrous tissue that shows change. At first there is a sero-fibrinous exudate without much cellular reaction; no organisms have been demonstrated on culture. Later, the œdema is absorbed and there is fibroblastic proliferation; the veins and arteries show much endarteritis and nerve fibrils show thickening of their sheaths. The condition goes on to the formation of a small area of dense white fibrous tissue and the surrounding vessels are thickened. Similar lesions are produced by injecting various organisms intravenously into animals, and it is more than possible that the lesions in man are produced by circulating organisms becoming arrested in capillaries where the circulation is poor. Recent investigations show that bacteriæmia (e.g., *B. coli* or staphylococci) may occur without definite illness.

There is no specific cause, and the various ætiological factors are as follows.

1. *Focal Infection.*—Clinicians are well aware that acute fibrositis may follow acute tonsillitis, sinusitis, tooth abscess, colitis, prostatitis, influenza, and similar infective conditions; it is also well known that a certain proportion of cases recover permanently when a septic focus is suitably treated.

2. *Trauma and strain* are common antecedents of fibrositis; rupture of capillaries and muscle-fibres is followed by exudation and fibrosis. Many different forms of injury can either cause or light up quiescent fibrositis; a slight muscle strain in a person subject to fibrositis may cause an acute attack. A girl practising back-hand top-spin strokes at tennis frequently missed the ball; she developed a painful thickening in the supinator brevis muscle. The so-called "tennis elbow" has a tender spot over the origin of the extensor muscles of the wrist and fingers from the external condyle of the humerus. Many of these cases are due to fibrositis. But the same spot may become painful and tender from lifting heavy weights such as a full watering-can when gardening. Acute fibrositis can develop in the scar formed by the healing of a muscle or ligament which has been torn. This explains some of the cases of persistent pain after an injury to the back muscles or to a joint.

A fracture is occasionally the cause of fibrositis. Painful thickenings may develop round the shoulder-joint, in the palmar fascia, and on a flexor tendon of a finger after a Colles' fracture. Again, certain patients develop stiff joints after a fracture while others do not. Sometimes every joint in the limb is stiff though the fracture is through the shaft of the bone and the anatomical result is good. Full movements may not be recovered for several months and sometimes there is permanent limitation of movement, especially in the finger-joints, which become contracted. In many of these cases there is no sign of arthritis, and no effusion. It seems that there is probably fibrositis of the ligaments of the joints. This may be due to poor circulation in the arm in a patient with a septic focus, the poor circulation being caused by the injury and the lack of movement of the limb from the use of a splint.

3. *Metabolic Changes.*

(*a*) *Exogenous.*—It is very probable that various products of digestion circulating in the blood may cause the inflammatory reaction, as in those cases of fibrositis following dietetic and alcoholic indiscretion.

(*b*) *Endogenous.*—Local metabolic products of muscular activity—e.g., lactic acid—may set up the inflammation. The elderly man, unaccustomed to riding exercise, frequently develops acute lumbago, apart from the usual stiffness of thigh and arm muscles, after the first day's ride.

Fibrositis is found mainly in the postural muscles, near their attachments to bone and tendon where the blood-supply is poor, as opposed to the muscles of locomotion with a plentiful blood-supply. Waste products of muscular activity accumulate in excess in parts with a poor circulation.

4. *Cold and Damp.*—The influence of these factors is well known. It is common for a Bell's palsy or stiff neck to come on after a railway journey or sleeping under an open window, and the lesion occurs on the side exposed to the draught. Similarly, an attack of acute lumbago is often a sequel to a game of tennis in which the patient has sweated profusely and has then sat down without a sweater and felt chilly across the loins. The patient with chronic fibrositis is often a "living barometer" and knows from the variations of his pains what the weather is going to do. The vasomotor mechanism is extremely delicate and responds to slight changes of temperature and pressure. The vessels in relation to fibrositic nodules have thickened walls and are therefore less likely to respond to these changes. When the weather becomes cold and raw there is a fall of temperature and barometric pressure and the body responds by general vaso-constriction of the skin vessels; the fibrositic areas, however, become congested and tense, with consequent pressure on nerve fibrils and pain. So long as the thickenings do not involve nerves, they are symptomless.

Symptoms.

The onset of fibrositis is usually very gradual. Painless thickenings develop in the muscles and fasciæ and sometimes there is creaking in joints on movement. Students in our school of physiotherapy frequently find these thickenings when practising massage on each other. Later there may be stiffness, aching, neuralgic pains along nerves, tingling and numbness, which only develop occasionally on waking in the morning and pass off on rising up and moving the limbs. These symptoms are probably due to a certain amount of exudation into the thickenings during the night; this disappears readily on movement. Sometimes frequent attacks of cramp are the first symptoms and abdominal cramp may be mistaken for some form of colic. Early fatigue on exertion may occur with special occupations and simulate an occupation-neurosis. The fibrositis can remain at this mild stage, with perhaps occasional acute attacks, or it can progress until the pain and other symptoms are present day and night. Acute attacks develop without a previous history of fibrositis, and recur at long intervals without intervening symptoms. It is probable that the thickening remains, but that there is pain only when there is exudation. The development of a septic focus explains some of these acute attacks. Other causes will be a change in the weather, especially to cold and damp, unsuitable food or drink, or an injury.

Special Types of Fibrositis.

Fibrositis of Muscle.—In the muscle, thickenings are felt which are indefinite in outline. During an acute attack the muscle will be contracted and rigid; the thickenings may then be difficult to feel but tender spots will be discovered on pressure. The commonest sites for these thickenings are in the posterior neck muscles, round the scapulæ, in the back muscles, especially near the iliac crests, and in the gluteal muscles. They are comparatively rare in the limbs and when they occur are commonly situated near the attachment of the muscle to bone. The blood-supply of a muscle is improved with movement, and it may be that the better blood-supply of the limb muscles prevents the local development of fibrositis. This is one reason why exercises are so important in the treatment. Full movements should be performed for each of the affected joints and muscles, and especially for the trunk, neck, shoulder-girdle and hip-girdle muscles.

The symptoms of fibrositis of muscle will depend on whether the condition is acute or chronic. During an acute attack the muscle is contracted and rigid, and there is severe local pain and tenderness. With chronic fibrositis there is a dull ache. Pressure on the thickening commonly causes local pain, but occasionally the pain may be referred down a nerve which is not in the neighbourhood of this thickening. Pressure on thickenings in the erector spinæ may cause pain along different nerves according to the level at which the thickening lies. In the dorsal region the pain is sometimes referred along an intercostal nerve, in the upper lumbar region along the external cutaneous nerve of the thigh, and in the lower lumbar region along the middle or internal cutaneous nerve of the thigh. Again, in the gluteal region, pressure on a thickening one or two inches below the iliac crest can refer pain down the great or small sciatic nerve, in the scapular region down a brachial nerve, and in the upper part of trapezius muscle along the great occipital nerve.

The thickenings are commonly found in muscles which are supplied by the same segment of the spinal cord as that in which the neuralgia occurs. Sometimes these thickenings are responsible for the referred pain, though pressure does not produce it. This is of great practical importance. A patient may complain of pain down a nerve; on examination it is found that the nerve is not unduly tender at any spot and there is no arthritis in neighbouring joints. But a thickening is found in some muscle supplied by the same segment of the spinal cord, and possibly pressure on the thickening causes the pain. The treatment should be directed to this thickening.

A patient complained of pain down the arm and tingling of the fingers. X rays showed the presence of cervical ribs. There was no wasting of the intrinsic hand muscles, and on examination a thickening was found below the spine of the scapula. Pressure on this thickening produced the pain.

Fibrositis of Nerve.—This is a perineuritis. Exudation into the nerve sheath is followed later, in chronic cases, by fibrous thickening. The onset is occasionally acute, but sometimes the thickening of the nerve trunk develops gradually with only occasional symptoms. When the nerve is superficial this thickening is often obvious. There is pain down the nerve with tingling and numbness over its sensory distribution. It is distinguished from the referred pain mentioned under fibrositis of muscle by the presence of tender spots on the trunk of the nerve and by resistance to movements which stretch the nerve. Sciatica is a good example. In cases due to fibrositis of the sciatic nerve there is tenderness on pressure at certain points over the nerve, and there is resistance to stretching the nerve. On the other hand, if the pain is due to muscle thickenings there will be tender spots in the gluteal region, usually one or two inches below the iliac crest. Pressure on one of these thickenings may cause the pain down the sciatic nerve. The nerve itself is not tender on pressure and can be stretched to the normal extent. Sometimes, however, thickenings in the gluteal region and fibrositis of the sciatic nerve occur together.

The nerve-fibres are commonly not affected but paralysis of muscles and loss of sensation over the cutaneous distribution may develop from pressure on the nerve. Facial paralysis is a common example. The nerve trunk swells and is compressed in its course through the stylomastoid foramen. Occasionally slight pressure on a nerve may cause a temporary paralysis with loss of sensation. This may occur on waking in the morning or after resting in a chair. Resting the arms on the sides of a chair may lead to

ulnar nerve paralysis. Usually this paralysis quickly disappears on moving the limb; also, as with symptoms of fibrositis, the nerve is only hypersensitive to pressure on certain days or with a change of weather. Occasionally the paralysis persists. The following cases are examples.

Foot-drop developed in one patient while kneeling to clean a grate, and in another while squatting when working in a garden. Wrist-drop was caused by lying with the hands behind the head for 15 minutes on a bale of paper. This last patient gave a history of numbness of the little finger at times, but not of complete ulnar nerve paralysis. Recovery-time varied between two and four months. There was no previous history of acute neuritis in any of these cases, but tender spots could be found along the course of the nerve.

This paralysis occurs from pressure at points where the nerve is comparatively superficial and is lying over bone. When the arm is rested on the side of a chair the ulnar nerve is pressed against the humerus just above the bend of the elbow. The musculospiral nerve can be compressed in the musculospiral groove on the back of the humerus when lying with the hands behind the head. The external popliteal nerve is compressed between the fibula and biceps femoris tendon when kneeling. If at the time there was an effusion into the sheath of the nerve, pressure paralysis would be likely to occur, since the nerve would be swollen and more liable to compression.

Fibrositis of a Joint.—The thickenings occur in the ligaments and, when the joint is superficial, can often be felt as small hard and tender nodules. In the acute stage the joint may be stiff and painful. But in the mild chronic stage there is often only a dull ache, which may be associated with creaking on movement. It is distinguished from arthritis by the absence of bony changes and synovial thickening. Also, since the inflammation only affects the ligaments, there is seldom much effusion into the joint.

Fibrositis of Fascia.—This may affect the superficial or deep fascia. Fibrositis of the superficial fascia is called panniculitis. There may be a subcutaneous thickening or a brawny mass adherent to the skin. It is often very difficult to decide whether the subcutaneous tissue is normal, since it varies very much in different individuals according to whether they are stout or thin. With panniculitis there will be aching pain and the thickening will be tender on pressure or gentle pinching. Fibrositis may occur in the deep fascia in the form of localised tender nodules. Sometimes there are no obvious thickenings, but there is creaking on applying friction-massage to the part. This is especially common with the deep fascia over the back muscles.

Fibrositis of Tendons.—This is relatively uncommon. As a rule the onset is acute, with severe pain and redness of the skin. The extensor tendons just above the wrist are most frequently affected and fine crepitus may be felt for three or four inches above the joint. The acute stage usually lasts from three to seven days, but the crepitus may persist for a month or more. In our experience it is uncommon to get adhesions, and complete resolution is the rule. Thickening of a tendon may come on insidiously, and crepitus, recognised by the patient, may be the first sign. Sometimes a well-defined nodule appears: one of these on the long flexor tendon of the hand is the cause of "snap-finger." The thickenings are tender on deep pressure and there may be pain on any movement which involves the use of the tendon.

Diagnosis.

Mistakes are usually due to insufficient examination. It is essential that the patient be properly stripped and lie down in such a way that the affected muscles are lax. A dusting powder should be applied to allow the examiner's fingers to slip easily over the skin. It often takes five minutes of careful kneading to localise the tender nodules and, unless these are accurately localised, treatment cannot be efficient. The average practitioner would never pronounce the lungs normal without an examination of at least three minutes, and yet few will spend the same time in examining for fibrositis.

The second point to remember is that chronic lumbago and sciatica are unusual in young subjects, and the practitioner should be on the look-out for a tuberculous lesion of bone and have an X ray taken if the pain lasts for several weeks.

Treatment of Acute Fibrositis.

General.—In all but the mildest types the patient should be put to bed. Continual application of mild dry heat is beneficial and can be supplied best by means of a 16 candle-power carbon bulb in a hand-lamp strapped to the inside of a bed-cradle. This keeps up a constant dry heat and can be regulated by the patient himself, as he can turn it off and on as required. At the onset a good hot bath, or better still a Turkish bath, will ease the pain, cause the skin to act, and generally make the patient more comfortable. The bowels should be well opened. The diet should consist of hot fluids only for the first 48 hours, with plenty of fruit juice and sugar; this ensures excretion by the skin and kidneys of toxins and metabolic products.

Drugs.—A Dover's powder at night gives a good night's rest; aspirin in big doses, grs. 15 6-hourly, relieves pain and is often almost a specific.

Local.—Of all forms of physiotherapy, heat is the most valuable in the acute stage. It may be given as moist heat, by the old-fashioned linseed and mustard poultice, or in a neater and more cleanly manner by Antiphlogistine. The applications must be kept really hot.

Heat.—Dry heat may be supplied by (1) a single carbon bulb of about 32 candle-power in a hand lamp; (2) a small radiant-heat bath; (3) a small electric radiator—the "bowl-fire type" is especially useful; or (4) a flat electrically heated pad. When available diathermy is especially valuable, since it differs from the above methods in that the deeper tissues are directly heated.

Massage.—Gentle effleurage, which consists in stroking the skin with the hand in the direction of the nearest lymphatic glands, should be employed from the beginning, since it tends to reduce the exudation and so relieve the pain. Friction-massage should be added as soon as the local tenderness is sufficiently diminished; the skin moving with the hand or finger is rubbed against the deeper tissues. This form of massage is applied to each thickening in turn and, unless the part is very tender, with heavy pressure.

Movements.—With fibrositis of muscle, very gentle active movements through a small range should be attempted even during the acute stage; these are gradually increased in range with the object of relaxing the muscle spasm. A hand pressed over the muscle, but not over the tender area, will often ease the pain on movement.

Counter-irritants.—The heat can be followed by local application of ultra-violet rays to cause a second or third degree erythema, or by the constant current; the effect of both is probably simply counter-irritation. They are preferable to other counter-irritants such as mustard, iodine, and vesicants, as they do not cause injury to the skin, which might prevent further massage.

Dry-cupping.—This old-fashioned treatment is easily applied anywhere and deserves further recognition, as it frequently relieves pain in a remarkable way.

Acupuncture.—If these other methods fail to relieve the pain in three or four days acupuncture should be given a trial. For this the skin is purified and a fairly wide area of skin and subcutaneous tissues infiltrated with 1 per cent. novocain by means of a fine hypodermic needle. Then a large needle from a 20 c.cm. syringe is passed through the skin and thrust slowly through the affected muscles in several different directions. As a rule a single skin puncture suffices to needle a fairly wide area of muscle.

Treatment of Chronic Fibrositis.

Septic Foci.—A thorough and careful search should be made for foci of sepsis. If the usual physical examination reveals nothing, radiograms should be taken of the teeth and nasal sinuses and a culture of the urine should be made in all doubtful cases. Any vaginal or aural discharge should be investigated and, if these prove negative, the stools should be examined bacteriologically. In cases in which nothing is found a course of Plombière's treatment is well worth a trial. The bowels should be opened twice a day. It is advisable to keep the patient on a diet that is mainly vegetarian for a week or two at least; plenty of fluids should be taken and a four-mile walk a day is an excellent rule. In adipose persons attempts should be made to reduce weight to the average figure.

Drugs.—There is no specific drug and medicines do not play a large part in treatment. Iodine in some form is undoubtedly valuable, especially Lugol's iodine solution; ℥v. twice daily is an average dose. A course of thyroid extract is useful and probably promotes a better metabolism of the skin tissues. It should be given in moderate doses—e.g., grs. 5 daily.

With the idea of increasing general immunity collosol manganese can be given intramuscularly and extra vitamins may be given in the form of radiostoleum. Intestinal antiseptics such as dimol or guaiacol are worth a trial in suitable cases.

Massage.—The application of heat is continued to ease the pain, but massage, consisting of effleurage and frictions, is the essential treatment. Each thickening must be treated in turn with a few minutes' massage and this must be persevered with daily. The majority of thickenings will disappear with this treatment, the more recent ones requiring a shorter course. The patient should be warned that massage is likely to increase the pain for the first few days.

Movements.—The muscles and joints are worked through their full range of movement, special attention being paid to the stretching of structures such as muscles, ligaments, or nerves, which are likely to become shortened by the contraction of the newly formed fibrous tissue. In the later stages of the course of treatment, exercises and the faradic current are employed to develop the wasted muscles.

When fibrositis is associated with obesity it is very important to reduce the weight with special diet and exercises. General faradism to the muscles, applied by the Bergonié method, is often very effective; it should be employed in those cases in which it is difficult to persuade the patient to perform the exercises with sufficient vigour and regularity.

Counter-irritants.—These may be used in cases of fibrositis in which the pain persists in spite of treatment; they are also of value in cases of perineuritis which are not amenable to treatment by massage.

Some Special Points in the Treatment of Perineuritis.—Heat is applied in the acute stage, either by means of radiant heat baths or by diathermy. The diathermy current can be used in two ways. It can be passed along the limb in strength only sufficient to cause mild heating (since a greater degree frequently increases the pain); or it may be given locally to the nerve at the tender points. In cases of facial paralysis the diathermy current or the constant galvanic current is applied to the region of the stylo-mastoid foramen to improve the circulation and reduce the swelling of the nerve. In the subacute and chronic stages of perineuritis, effleurage and frictions are used along the course of the nerve. The frictions are given with considerable pressure to deep nerves such as the sciatic, but with less pressure to superficial nerves, especially at points where they lie over bone. With certain nerves the massage is followed by nerve stretching. At first this is performed gently, but with increased force as the pain diminishes. Massage, exercises, and the faradic current are utilised to develop the wasted muscles.

With pressure-paralysis special splints should be worn for wrist or foot-drop. Commonly the faradic reaction is only slightly reduced, so that this current can be used for muscle stimulation. But for facial paralysis the galvanic current is more comfortable because the muscles are usually hyperexcitable to this current and painless contractions can be obtained with about 1 ma., while the faradic current is very painful on the face. As soon as any active movement returns to the paralysed muscles it is carefully re-educated with graduated exercises.

Surgical.—Localised chronic painful nodules which do not improve with medical treatment in a few weeks should be excised under a local anæsthetic. The definite tender thickenings which can be felt in the nerve in sciatica should be incised under general anæsthesia and the nerve should then be forcibly stretched. Distension of the sciatic sheath by means of injection of 100 c.cm. of normal saline or 1 per cent. quinine urea-hydrochloride has met with a few excellent results in our hands, but on the whole has been disappointing.

The rather more diffuse thickenings that occur in the lumbar and scapular regions may be infiltrated with an oily solution known as A.B.A. (Allen and Hanburys). This is slowly absorbed and produces analgesia for one to three weeks; during this time rather more drastic massage may be given, with complete cure in some cases. This solution usually causes a burning sensation for a few minutes.

In conclusion, we would point out that we do not claim that any of this treatment is original; our object in writing this article was to set out the forms of treatment that we have found most useful and to emphasise the importance of accurate diagnosis.

MEDICINE AND THE LAW.

Marriage Unawares.

Earlier in this month the Divorce Court had to deal with a petition for nullity of marriage presented by a petitioner who claimed that the marriage was invalid owing to his mental incapacity due to prolonged and persistent confusional psychosis. In December, 1915, he had been wounded at Gallipoli in the arms, legs, and possibly head. On his way to England he was examined by a nerve specialist who thought him a bad case. The petitioner contended that he did not know or appreciate what he was doing when he was married. The judge did not accept the contention. The petitioner had himself signed the marriage register. His friend, a minister, described him as having acted like a normal man. He had bought clothes and a ring for the wedding. There was a suggestion that he was not normal because he engaged different flats in different names. There was not, however, said Mr. Justice Bateson, such "confusional psychosis" as could be interpreted as unsoundness of mind at the time of the marriage.

A lunatic so found cannot enter into a valid contract of marriage. This is the purport of the Marriage of Lunatics Act of 1817, which replaced an Act of 1742 said to have been passed after a scandal associated with a natural son of the Earl of Bradford to whom his father left a large fortune. Apart from the Act of 1817 there is nothing to prevent a person of weak or unsound mind from validly contracting a marriage unless it is afterwards proved that he or she did not understand or consent to the contract. The cases on this subject have been interwoven with allegations of fraud, undue influence, and other elements; but the law as laid down by Sir James Hannen in Durham *v.* Durham in 1885 is reasonably clear. The contract of marriage, said Sir James, is a very simple one which does not require a high degree of intelligence to comprehend. A mere comprehension of the words of the promises might not be enough. The mind of one of the parties might

be capable of such comprehension but yet might be affected by such delusions or other symptoms of insanity as might satisfy the court that there was not a real appreciation of the engagement apparently entered into. In Durham *v.* Durham Sir William Gull gave evidence that Lady Durham was depressed in health but showed no trace of mental disease. Three medical witnesses who had examined her at a particular date observed none of the mental symptoms alleged to exist. The judge held that any change in her condition from sound to unsound mind had occurred after marriage; there was no proof of mental unsoundness at the date of the marriage. The husband's petition for nullity, based on the wife's insanity, was therefore dismissed. In the same year the same judge, in Hunter *v.* Edney, pronounced a decree on the ground that the wife had not been able to know and appreciate the act she was doing in being married but "took an entirely morbid and diseased view of it." This last case was followed in 1908 by Bargrave Deane J. in Jackson *v.* Jackson, where the respondent was certified insane and was in confinement in an asylum. The question, said the judge, was not merely whether she had been aware that she was going through the ceremony of marriage but whether she was capable of understanding the nature of the contract she was entering into, free from the influence of morbid delusions on the subject.

As will have been gathered from these decisions the vital date at which it is material for this purpose to know the mental condition of the party alleged to be mentally unsound is the date of the marriage. Insanity supervening later is for this purpose immaterial, though, as is well known, the advocates of divorce law reform desire to see the law changed so that the subsequent insanity of husband or wife can be made a ground for dissolving the marriage tie. The decisions also make it clear that husband and wife can petition on the ground of either their own or their spouse's insanity at the time of the marriage. The burden of proof is on the party alleging the invalidity of the marriage contract, for everything is presumed in favour of a marriage validly solemnised. In the recent case before Mr. Justice Bateson the proof was inadequate. Incidentally the case showed the characteristic reaction of the common sense legal view to the suggestion of "confusional psychosis." "Medical evidence," said the judge, "as to a dual ego, personality or individuality would lead to strange results if the same man in one personality—which might be called the unreal—could contract a marriage and the same man in another capacity—which might be called the real—could, when it revived, escape from such marriage."

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

Recognition of Medical Degrees.

THE question continues to attract general attention. Comment for the most part is coloured by the feeling natural under present political conditions, and much of the criticism shows no attempt at a fair estimate of the situation. Here and there one notices more moderate statements, such as that of the Vice-Chancellor of Bombay University in addressing a conference of the medical faculties of all the Indian universities. This conference met in Bombay in May to consider the situation arising from the withdrawal, by the General Medical Council, of its recognition of the Indian universities for the purpose of registration, and to suggest measures for safeguarding the interests of Indian medical students and graduates. In his address the Vice-Chancellor outlined the course of events which led up to the crisis, pointing out the influence of the Montague-Chelmsford reforms and the transference to popular control of medicine, amongst other subjects, in bringing it about. The conference resolved to recommend the Government of India to appoint a joint university medical board, with the Director-General I.M.S. as its president, to regulate medical studies and to arrange for several medical inspectors to take the place of the single inspector whose appointment was asked for by the General Medical Council, pending the establishment of an All-India medical council. This recommendation when it was put forward by the Government of India to the General Medical Council was, it will be remembered, not accepted. An encouraging feature is that opinion is crystallising in favour of an All-India council. The *Antiseptic*, a medical paper published in Madras, recalls the attitude of the provincial ministers who opposed the proposal originally, and urges their conversion at any cost, while the *Sind Medical Journal*, in the midst of suggestions for measures of retaliation, also stresses the importance of the early formation of such a council. This may, indeed, be the only way out of the impasse.

The Supply of Quinine.

The Royal Commission on Agriculture recommended that the production of cinchona should be centralised under the Government of India. Madras has had its own cinchona department for the last 70 years, but the supply has never equalled the demand, and the present position is that India depends for at least 60 per cent. of its quinine on Java-grown bark. Clearly much remains to be done before India becomes self-supporting. The Royal Commission urged the Government to take energetic action in opening new areas under cinchona, and if a plentiful supply is to be assured, this will have to be done. But an extensive programme of planting will entail large expenditure which those in charge of the undertaking will desire to cover by some guarantee of purchase on the part of the provinces concerned. Apparently this has not yet been obtained. As long as the supply is dependent on outside sources it seems impossible to obtain quinine or the other cinchona alkaloids at a reasonable price. The world has been for some time increasingly dependent on the island of Java for these drugs, which are now a virtual monopoly of the Dutch.

Priestcraft.

A curious movement has been started in Bombay by an eminent physician, one or two prominent politicians, and some theosophists, backed, it is stated in the *Times of India*, by a large number of Congressmen and other influential persons representative of castes, creeds, and religions all over India. A society called the Anti-Priestcraft Association has been formed, with the object of combating all religious and social beliefs, customs, and institutions which cannot stand the test of reason. It is emphasised that the association is not anti-religious, but is intended to fight superstitions which have been imposed by interested persons. The chairman of the inaugural meeting remarked that all religions were good in the beginning, but tended to become priest-ridden and to degenerate with the passage of time. Another speaker stated that their object was to intellectualise religion, and to accustom men and women to make reason their supreme guide in all their affairs. It is hardly surprising that orthodox religious leaders of all communities have held aloof from the movement, but in India, as in all eastern countries (and perhaps elsewhere), it would be easy to substantiate the contention that no real advance is possible until the fetters forged by the priestly caste are broken. In medicine and other scientific subjects this is particularly true.

ELLESMERE PORT AND DISTRICT HOSPITAL.—This institution, simultaneously with being enlarged, has dropped the word "Cottage" from its name. The extension consists of two wards with 28 beds, bringing the total number of beds to 50. The cost has been £4000.

BUCHAREST.

(FROM OUR OWN CORRESPONDENT.)

Ministries and Medicine.

THE *Praxis Medici* reports that the Government is going to amalgamate the ministry of health with the ministry of labour, and it is widely felt that this step would be bad both for the public health and the medical profession. It is noteworthy, not only in Rumania but in other countries, that ministers of health are not medical men. In the cabinet which left office a fortnight ago, when Prince Carol returned to take up his throne, two physicians held portfolios, one as minister for home affairs and the other for agriculture. While all the other professions in Rumania get powerful support from any of their members who enter the Government, medical men who reach the pedestal of ministry deny all community with their past and with professional obligations attaching to it. Vajda or Dobrescu, although doctors, have never taken the remotest part in any medical cause or movements. They never even proposed that Prof. Moldovan should be made minister of health, although he is the obvious man for the post. He has become ministerial secretary of health in the Government formed by Maniu on June 14th. Again, in the Government of Bratianu there were two medical ministers, Anghelescu and Lupu, and it was characteristic of Prof. Anghelescu, who has twice been minister of education, that during his ministry he did not want to hear anything about medical affairs, while now that he is out of office he seems to feel himself a physician again. If our medical ministers had cared more for the affairs of the profession there would have been no proposal to abolish the ministry of health—that is the general opinion of Rumanian doctors. The name suggested for the new combination is the Ministry of Welfare.

Restriction of Cremation in Rumania.

A few years ago the council of the city of Bucharest set up a crematorium, disregarding the energetic protests of the clerical party, which has a big influence in Rumania. The crematorium started work about two years ago, and bodies were burnt without adequate safeguards and regulations. Recently a man was cremated who was regarded as a suicide, and a few days afterwards the suspicion arose that he had been murdered. Prof. Mina Minovici, who had a large share in creating the crematorium, has asked the minister of justice to forbid further cremation until regulations have been drawn up. For the time being, only bodies which have been examined post mortem may be burnt.

A Private Medical Clinic.

Under the title of "Clinica Medicilor Asociati, S.A." (Clinic of Associated Physicians Co., Ltd.) a company has been formed and duly registered in one of the districts of Bucharest. It starts with whole-page advertisements in the daily papers, and announces that the clinic is under the management of university professors, lecturers, present and late assistants, and hospital senior and junior physicians. It has 12 sections, and besides the attending physicians there is also a scientific committee, consisting of university professors, at the service of patients. The advertisements do not fail to point out that the chiefs of the sections are specialists who have been trained at Paris, Rome, Vienna, Bucharest, and Budapest, and have acted as assistants to the most celebrated teachers. Furthermore, it is to be noted that there are 10 auxiliary doctors and 15 "out-doctors." Besides sections for dermatology and syphilology there is also one for venereal diseases. The radiological section includes X rays, ultra-violet rays, diathermy, electrothermy, and also hydrotherapy. The twelfth section is the "Plaja artificala," or artificial swimming pool, which is under the control of a committee of specialists.

The clinic calls itself a preventive medical institution organised according to the pattern of the American Life Institute. Every member, including those who are healthy, receives a health sheet, whereon radioscopic and laboratory reports are recorded. The clinic endeavours to prevent disease or nip it in the bud. If a member falls ill he is to receive medical attention and drugs without stint. Patients will pay no extra fees for calling the doctors to their own houses. Dental treatment is free, and even the first two salvarsan courses are given free to those needing it—all these privileges being included in the membership fee, which is 200 lei monthly (5*s.*) for single men or women, and 300 leis (7*s.* 6*d.*) for those who are married.

The profession in this country is unanimously against this commercialisation of the medical sciences. They say that now, when we are carrying on a keen fight against the socialisation of medical practice, when even the "free choice" system of insurance is regarded as a method to be rejected, when already voices are heard saying that the ever-increasing number of hospitals cripple the physician, then it is but natural that practitioners should be righteously indignant about the enterprise of the 18 "apostles," as they call them, who want to embrace everybody, without exception, be he rich or poor. Those who say this forget that in Bucharest, apart from the insurance offices, there are sick clubs for every large enterprise; every ministry employs a doctor for medical attendance on its staff, while small employers have their own insurance clubs. What, then, remains for the poor practitioner? Public officials and commercial employees are not paid so well that they can enrol in this new insurance club if they are unsatisfied with those prescribed by law. Thus nothing but the middle-class remains to be exploited by the new association. But this is the stratum of the community which has been left for private practice and which assures his daily bread, though scarcely anything more, to the practitioner. So far the Rumanian Medical Association has taken no notice of the new enterprise, but the matter is likely to come up for discussion at the annual congress, and the institution will probably have to be closed.

Open Coffins.

The new public health Bill now being drafted in Bulgaria puts an end to an old oriental custom which has made a bad impression on many foreigners who have had the bad luck to see a burial there. It is the rule in Sofia, the capital, and in several other towns, to carry the dead from the mourning house to the church and from there to the cemetery in open coffins. Every spectator or follower has the right to see the body. The health authorities of Bulgaria hold that this is not a spectacle which fits in with the noisy traffic of streets, and if the Bill becomes a law the coffins will have to be closed in the mourning house.

Abortion in Russia.

A Bucharest doctor, just returned from Russia, says that since abortion was legalised in Russia the number of abortions has neither increased nor decreased. A happy consequence of the law, however, has been a great reduction in the number of criminal abortions. As abortion has to be notified by the practitioner, the statistics are fairly reliable; only those miscarriages are kept secret in which the obvious misconduct of a girl or wife demands discretion, and even then it is very rare for them to be hushed up, for the penalty imposed on the reticent doctor is too heavy to be risked. In Leningrad the majority of aborting women are married multiparæ who do household work for their own family. Tuberculosis is the most common indication for interrupting pregnancy, the next being social and economic indications. Since the legalisation of artificial

miscarriage, perforation of the uterus and infections following curettage are much less common, because the operations are performed with asepsis. Even so, chronic disease of the genital tract is met with, according to Levit, in 20 per cent. of curettages performed in the out-patient departments of the clinics. Bronnikowa at the State clinic in Moscow observes that the more often a woman aborts the less is the weight of her child. The conclusion may be drawn that even if abortion passes off normally and without apparent complications in a healthy woman, the uterus is, nevertheless, made somewhat less fit for further child-bearing.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Evacuation of St. Kilda.

AN annotation in your issue of May 24th (p. 1139) mentioned the possibility that the islanders could be induced to leave St. Kilda. Mr. Tom Johnston, M.P., the Under Secretary of State for Scotland, has visited the island and reports that the number of people concerned is about 36. Among these there are only eight able-bodied men and these are not enough to maintain the life even of this small community. Careful inquiry has been made into the conditions of each family; relatives on the mainland have been traced out; possibilities of residence in different mainland areas have been explored, and it is said that the difficulties of accommodating the remnant in the County of Inverness, to which the island belongs, will not be serious. At present, apparently, members of the community are unanimous in their desire to leave; but this does not exclude the certainty that they will suffer badly from nostalgia. As the islands seem to have 1500 acres of grazing land and a smaller portion of arable land, it is possible that some industrial use might well be made of it. A geologist who recently spent some time there suggests that, apart from sheep and crops, the rock offers facilities for the creation of good quarries. The question of a meteorological station or a wireless station has been discussed; but St. Kilda apparently has no advantage in this respect over the places already in use.

Dundee Maternity Hospital.

A new maternity hospital in association with Dundee Royal Infirmary was opened by Mrs. F. B. Sharp on Friday last. It is a ferro-concrete building of three storeys, and incorporates departments for the care of in- and ante-natal patients, district room and inquiry office, students' room, and lecture theatre suite. There are two wards each of 12 beds, and wards of two beds each. Suitable and separate accommodation has been provided for the delivery and after-care of "failed forceps" and other potentially septic patients—the admission of these women being safeguarded by their passing through two admission departments. Rooms are set apart for babies, for premature infants, for women suffering from eclampsia and for those in the first stage of labour. A large flat roof, suitably screened from the wind, is served by the lift. Some special features are adequate provision for the sterilisation of bedpans, soiled linen chutes, emergency lighting at all strategic positions, X ray and electrocardiograph plugs. Adjoining the delivery room and its adjuncts is the new gynæcological operation theatre complete with surgeon's room with spray bath, wash-up, sterilising and instrument rooms, and students' gallery; the newest type of scialytic light affords very satisfactory illumination during perineal operations. Doors and woodwork are made of teak, furnishings are in oak, and floors laid in terazzo and oak blocks. The hospital is separate from the main building of the Royal Infirmary to which it is connected by a short bridge at the level of the first floor.

The late Mr. Skirving.

By the death of Mr. Scot Skirving, at the age of 61, the Edinburgh school loses another favourite surgeon. He relinquished the position of senior surgeon at the Royal Infirmary about two years ago. A great grandson, it is said, of Adam Skirving, the author of "Hi! Johnny Cope," one of the most famous of the Jacobite songs, he was educated at Edinburgh Academy, Cheltenham College, and Edinburgh University. He was house surgeon to the late Prof. Chiene, and went with him to the South African War, being attached to the Imperial Yeomanry Field Hospital. For his services he received the C.M.G. On his return, he became a surgeon at Leith Hospital and afterwards at the Edinburgh Royal Infirmary. In the late war he served for a year in France, and for the rest of the time he was attached to Bangour Hospital. At Edinburgh he took an interest in University affairs, and became senior president of the Students' Representative Council. He was a sound teacher, and had published a text-book "Applied Anatomy and Operative Surgery," as well as many surgical papers. He drops out of the race at a comparatively early age; but he has left a reputation of careful and solid work, and many friends will miss his cheerful greeting.

Public Health Services.

SCHOOL MEDICAL SERVICE.

—	No. on roll.	Average attendance.	Routine inspection.	Special reinspection.	Per cent. of defects.
Sheffield ..	77,067	69,506	26,551	128,461	15·89
Warwickshire ..	36,650	32,849	11,865	7,862	22·7
Ilford ..	15,562	—	6,254	9,573	23·7

Sheffield.

Dr. T. Chetwood remarks of medical inspection, which has now been in force for rather more than 20 years, that, although its primary purpose was to fit children to receive full benefit from the education provided, its value can only be fully recognised if regarded as an essential factor in the national health. Medical and dental inspections are now so much a part of the educational system that the setting apart of a special room for this purpose may well be looked for in all new schools; in Sheffield these rooms have been made to serve the wider purposes of branch clinics. The scheme of clinics in the city is very extensive and the attendances this year and last year (289,688 and 307,055) are without precedent, which shows that the resources of the service are by no means exhausted. No doubt as the parents become better acquainted with the benefits of the system, they become more and more ready to avail themselves of its opportunities. The percentage of parents attending medical inspections was 69·86, a remarkable figure. Close association is kept up with staffs of hospitals and with private practitioners, and Dr. Chetwood expresses appreciation of their help in providing for the children's needs. Much of the treatment is given by them; the clinics were established to deal with such minor ailments and other conditions as did not lend themselves to effective treatment elsewhere. Of this orthopædic treatment is a good example, and Sheffield doctors have not been slow to utilise the facilities provided by the local authority. The scheme includes a surgical consultant, Mr. W. J. Lytle, F.R.C.S., hospital treatment, massage, and electrical treatment at the Edgar Allen Institute, and schools for the physically defective. The type of child admitted to these schools shows a change during recent years; there are fewer cripples, 48 per

cent. instead of 74 in 1920, and more children of rheumatic type. It might be fair to deduce from Dr. Chetwood's statement that these P.D. schools are likely to become less of homes for incurables and more a part of a general scheme of treatment and prevention. Dental work is developing steadily, and before long the service will be sufficient to secure for the school population a condition of dental soundness. A special investigation by Mr. E. A. Reeve shows the advantage of dental treatment at regular intervals during school life. Sheffield has a nursery school with 100 places; its activities include the care of the difficult and nervous child, and Dr. Annie Sykes aims at eliciting the coöperation of parents so as to prolong the good physical and mental environment of the pupils after they have left school. Among the parental mistakes are cited overclothing, unwise punishment, and indiscriminate drugging.

Warwickshire.

Dr. A. Hamilton Wood reports progress but evidently suffers from shortage of staff. Difficulty was experienced in completing routine medical inspections and it has been impossible to make reinspections for following up. It is not always realised as it should be what demands are now made on the time of school medical officers, who, over and above the ordinary medical inspections with following up, have to deal with special examinations, refractions, visits to cases referred by attendance officers, visits to secondary schools, work at the clinics, health lectures, and even attendance at police-courts. The appointment of another assistant would allow of the provision of further minor ailment clinics in the county; a second could undertake the supervision of children between the ages of 2 and 5, so strongly recommended nowadays. The present senior assistant would then have leisure to deputise for the county officer. The care of the pre-school child, recommended in Circular 1054, will involve extension of treatment facilities and more health visitors; last year only two visits were paid to each school for cleanliness surveys. Some relief is expected from the appointment of three "dental attendants"; in the past the health visitors in addition to their other duties have assisted the dentists. The number of operations for adenoids has fallen from 64·3 per cent. last year to 58 this; the facilities provided are very complete for a county area and the low percentage is the result of inadequate following up. Mr. P. R. Marsh, organiser of physical training, describes the different conceptions of physical training which are held. To some it is merely drill more or less military; to others a means of attaining strength. The value to health and education is, however, increasingly recognised, the children becoming more intelligent, responsive, and self-reliant. Orthopædic treatment is given to large numbers of children, many of them of pre-school age; a clinic at Solihull will complete the scheme.

Ilford.

Dr. A. H. G. Burton compares the figures for his borough with the averages for the country. The incidence of various defects found at inspections is about the average, as is also the percentage of defective children. But Ilford has 74·6 per 1000 (compared with 86·8 for the whole country) with defective vision, and 1·8 (compared with 8·9) with squint. There is no obvious explanation for the lower rate in Ilford as the standard described in Dr. Burton's analysis seems rather a high one. Again he contrasts the incidence rate of defects, physical and mental; here too the differences are slight, except in regard to crippled children, 1·7 in Ilford compared with 9·1 per 1000 in the whole country. Here the explanation is that the Ilford definition is a stringent one including only those children who are so crippled as to require instruction at a cripple school; it appears to exclude all those who can attend elementary schools with special precautions. A third table contrasts the causes of death, at all ages and at school age, over the whole country and in Ilford. On this subject some of Dr. Burton's comments are:—

(1) That there were more deaths from all causes in school-children in Ilford is partly but, not altogether, explained by its large child population.

(2) That tuberculosis is specially high in school-children in the borough, a reason for satisfaction at the recent establishment of an open-air school.

(3) The relatively high number of deaths from measles and whooping-cough in children reflects perhaps the lack of hospital accommodation for these childish fevers.

(4) Similarly, the high figures for heart disease might be associated with the non-existence in the borough of any rheumatic clinic or special department for children suffering from subacute rheumatism causing heart disease.

The last comment provides an argument for a special P.D. school which would accept all the cripples and children with severe heart disease, including those at present attending elementary schools with special precaution. There is need of a special M.D. school for mentally defective children, but Ilford is in advance of many towns of its size in having an open-air school at Benton, which was opened in January, 1929, with accommodation for 90 pupils and is giving excellent results, physical and mental; the latter is shown by an increase of the "mental age" by one and three-quarter years in the 12 months. The high average percentage of attendance (87·3) may be attributable in part to the fact that the pupils are brought to the school by ambulance, but it also reflects the enthusiasm and interest which the school has aroused in children and parents. The percentage of dental treatment at Benton is 100, whereas in some other schools it is little over 10. Apart from the lack of a special P.D. school, the orthopædic scheme established towards the end of the year is complete, including an orthopædic consultant Mr. J. B. Barnett, F.R.C.S., an orthopædic clinic with a qualified orthopædic nurse-masseuse, and three beds in the Royal National Hospital. A further extension of the scheme may be seen in the work of the instructor of physical training whose duties include the arrangement of special home exercises, in consultation with the school medical officer, for a number of cases of minor physical defects.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 14TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 266 (last week 237); scarlet fever, 1430; diphtheria, 988; enteric fever, 52; pneumonia, 842; puerperal fever, 41; puerperal pyrexia, 76; cerebro-spinal fever, 12; acute poliomyelitis, 2; acute polio-encephalitis, 2; encephalitis lethargica, 17; continued fever, 2; dysentery, 5; ophthalmia neonatorum, 103. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 17th–18th was as follows:—Small-pox, 460 under treatment, 11 under observation (last week 434 and 25 respectively); scarlet fever, 1986; diphtheria, 2104; enteric fever, 26; measles, 615; whooping-cough, 79; puerperal fever, 24 (plus 13 babies); encephalitis lethargica, 122; poliomyelitis, 1; "other diseases," 18. At St. Margaret's Hospital there were 18 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 43 (8) from measles, 7 (3) from scarlet fever, 11 (0) from whooping-cough, 21 (3) from diphtheria, 43 (8) from diarrhœa and enteritis under two years, and 29 (3) from influenza. The figures in parentheses are those for London itself.

Seven fatal cases of measles were reported from Liverpool, 3 each from Southampton and Birmingham. Liverpool reported 9 deaths from diarrhœa and Manchester 3. Six deaths were attributed to influenza at Manchester.

The number of stillbirths notified during the week was 287 (corresponding to a rate of 47 per 1000 births), including 54 in London.

The Services.

INDIAN MEDICAL SERVICE: ANNUAL DINNER.

SEVENTY-FOUR officers of the Indian Medical Service attended the annual dinner at The Trocadero, London, on June 18th. In the absence through illness of Major-General F. H. C. Hutchinson, C.I.E., the chair was taken by Major-General G. Tate, C.I.E., K.H.S. There were present as guests: Sir Harry Waters, Chief Medical Officer of Indian State Railways; Air Vice-Marshal Sir David Munro, C.I.E.; Mr. F. H. Brown, C.I.E., *Times* Correspondent for India and the East; Dr. N. G. Horner; and Dr. E. C. Morland. Five probationers—Capt. E. G. Hurdwood, Capt. M. H. Wace, Capt. J. McM. Wilder, Lieut. F. H. A. L. Davidson, Lieut. R. T. Hicks—attended by invitation. The other members of the Service present were as follows:—

Major-Generals: R. W. Anthony, C.I.E.; A. A. Gibbs, K.H.P.; J. D. Graham, C.I.E.; G. F. A. Harris, C.S.I.; A. Hooton, C.I.E.; Sir Leonard Rogers, C.I.E., F.R.S.; Sir T. H. Symons, K.B.E.

Colonels: H. Ainsworth; J. Anderson, C.I.E.; R. F. Baird; J. Fullergood; T. A. Granger, C.M.G.; C. R. M. Green; A. J. Macnab, C.B., C.M.G.; F. P. Mackie, O.B.E.; R. A. Needham, C.I.E., D.S.O.; J. J. Pratt.

Lieut.-Colonels: A. W. Alcock, C.I.E., F.R.S.; W. G. P. Alpin, O.B.E.; H. E. Brown; A. Buchanan; W. V. Coppinger, D.S.O.; A. G. Coullie; D. G. Crawford; J. M. Crawford, O.B.E.; J. K. S. Fleming, C.B.E.; G. D. Franklin, C.I.E., O.B.E., K.H.S.; A. B. Fry, C.I.E., D.S.O.; G. F. Graham; A. E. Grisewood; A. F. Hamilton; J. A. Hamilton, C.M.G.; W. G. Hamilton; B. Higham; E. V. Hugo, C.M.G.; J. B. Hunter Dalzell, O.B.E.; S. P. James; A. Kirkpatrick; E. C. G. Maddock, C.I.E.; F. O. N. Mell, C.I.E.; A. Miller; T. R. Mulroney; F. O'Kinealy, C.V.O., C.I.E.; C. H. Reinhold; A. J. H. Russell, C.B.E.; G. M. C. Smith, C.M.G.; R. Steen; T. A. N. Stokes; Ashton Street; W. A. Sykes, D.S.O.; C. Thomson; G. Sloane Thomson; W. H. Thornhill; E. L. Ward, C.B.E.; D. Warliker; C. M. Wilson, O.B.E.

Majors: R. T. Advani; S. C. Alagappam; F. J. Anderson, M.C.; D. Clyde; Sir T. Carey Evans, M.C.; N. H. Hume; Clive Newcombe; J. M. Shah.

Captains: M. P. Atkinson; R. N. Bhandari; J. Carrey; H. A. Culhane; J. R. Katariya; R. MacRobert; Percy Devonport; S. D. S. Greval; H. M. Strickland; F. H. Whyte.

ROYAL NAVAL MEDICAL SERVICE.

The following appointments are notified: Surg. Capts. P. L. Crosbie to *Ganges*, for R.N. Sick Quarters, Shotley; and G. K. Bushe to *Pembroke*, for R.N. Barracks, Chatham. Surg. Comdr. W. F. Beattie to *Calcutta*, and as Squadron Medical Officer.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Sub-Lt. D. M. Dean to be Surg. Sub-Lt.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. J. M. M. Crawford having attained the age for compulsory retirement is placed on retd. pay.

The undermentioned Majs. (temp. Lt.-Cols.) to be Lt.-Cols.: G. B. Edwards, vice Lt.-Col. E. Bennett, and J. W. L. Scott, vice Lt.-Col. J. M. M. Crawford.

The undermentioned Majs. to be temp. Lt.-Cols.: T. C. C. Leslie and L. G. Gibson.

Maj. H. J. Bensted, from the secd. list, is restd. to the estabt.

Capt. D. W. M. Mackenzie to be Maj. (prov.).

Lt. W. T. Baker relinquishes his temp. commn.

ARMY DENTAL CORPS.

Capt. H. E. Flavelle to be Maj.

ARMY RESERVE OF OFFICERS.

Lt.-Col. F. P. Lauder, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

Capt. E. B. Murrell resigns his commn.

Lt. A. H. Whyte to be Capt.

Maj.-Gen. J. W. D. Megaw, C.I.E., I.M.S., Honorary Surgeon to the Viceroy of India, has been appointed Honorary Physician to the King, and Lt.-Col. F. D. G. Howell, *D.S.O., M.C.*, R.A.M.C., Honorary Surgeon to the King, with promotion to Brevet Colonel.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

MENTAL TREATMENT BILL.

ON Friday, June 20th, the House of Commons considered the Lords' amendments to the Commons' amendments of the Mental Treatment Bill.

Accounts of Licensed Houses.

A message was read from the Lords stating that they disagreed with the amendment made by the Commons to insert a new clause (Accounts of Licensed Houses) because it entailed undue interference in the management of private institutions.

Miss LAWRENCE (Parliamentary Secretary to the Ministry of Health) moved "that this House doth agree with the Lords in the said amendment." She said the clause formed no part of the original Bill. As was stated by the Minister of Health on the second reading, it was not proposed to deal with the question of licensed houses in this measure, in view of the perplexity and controversial nature of the subject. In the committee stage Sir B. Merriman had suggested the substance of this new clause. The Government thought the clause was not objectionable in itself, and as there appeared to be a strong desire to insert it, they agreed to it in committee; but the remarks of the Minister were justified when the Bill went back to the House of Lords, because this innocent little amendment was met there with prolonged and violent opposition. The Government felt that the matter was not one of very great importance in itself. It was a small amendment dealing with the fringe of a subject which future Parliaments would no doubt deal with fully and properly. The Government did not feel it worth while at this stage to endanger the existence of the Bill by entering upon a prolonged controversy with the House of Lords on this very minor amendment. Moreover time was of great importance to the local authorities in their preparations for putting this Bill into operation. She hoped, therefore, that in the circumstances, Sir B. Merriman would not press this point.

Sir B. MERRIMAN said he thought the Parliamentary Secretary was inclined to minimise the importance of this clause. The genesis of the clause was a very strong recommendation of the Royal Commission. The amendment was put into the Bill with practically unanimous support of the House of Commons. It might involve restrictions in the case of institutions which were not being properly conducted, but they had not detected in the policy of the Government any particular regard for the sanctity of private institutions. In the hope that this new respect for the sanctity of private institutions might receive every encouragement, he did not propose to oppose the motion which had been moved by the Parliamentary Secretary.

Mr. GOULD said in the interests of public decency and fair charges—he had heard of charges of £20 a week per patient by these private institutions—he regretted the refusal of the Government to insist upon the clause, and he regarded their action as a real breach of faith with the committee.

Dr. MORRIS-JONES said he hoped the House would support the motion of the Parliamentary Secretary. He felt at the time when this clause was proposed that it was rather a dangerous amendment. After all the Bill did not deal with licensed houses at all, and the House would remember that the Royal Commission were divided in their views on this question. This clause would not make any difference to the charges made by these private institutions; it would only involve an audit of their accounts. At the present time the accounts of these institutions had to be audited in the ordinary way for income-tax purposes, and he thought this clause would be a serious and rather unwarranted infringement of the rights of private individuals.

The motion to agree with the Lords' amendment was agreed to.

WORKMEN'S COMPENSATION (SILICOSIS) BILL.

Mr. SHORT (Under Secretary to the Home Office), in moving the second reading of the Workmen's Compensation (Silicosis) Bill (which has already passed through the House of Lords), said the object of the measure was to amend Section 47 of the Workmen's Compensation Act, 1925, which gave power to the Home Secretary to make schemes enabling employers to pay compensation to workpeople who contracted the disease of silicosis, caused by silica dust. The Bill provided for the introduction of improved medical arrangements for the diagnosis and certification of cases of silicosis, and extended Section 47 of the Act of 1925 to fibrosis of the lungs caused by asbestos dust, which was now known

as asbestosis. The diagnosis of silicosis had been found to be a very difficult matter requiring special skill, and the latest scientific knowledge and appliances in connexion with radiography, and so forth. The Act of 1925 made provision for schemes for the appointment of medical boards consisting of whole-time medical officers, but it made no provision for the setting up of any special fund out of which those officers could be paid; and it was only in the case of the refractories and sandstone industries that a general trade compensation fund had been created to which salaries might be charged, and such a medical board had been instituted. In 1928 Lord Brentford, when he was Home Secretary, launched the Various Industries Silicosis Scheme, but no compensation fund had been created by any of the industries covered by the scheme. The medical examination and certification in the case of silicosis depended on what he might term the ordinary medical machinery; in other words, the certifying factory surgeon was the responsible person, and there was an appeal to the medical referees under the Workmen's Compensation Act. This system had been found to be totally inadequate as regarded the diagnosis of silicosis. It had to be admitted that the certifying factory surgeon was not an expert. He had seldom, if ever, at his disposal radiographic and other facilities, and at the time this scheme was originally introduced it was fully understood that it would be of a very temporary character. Considerable hardships had arisen out of these very unsatisfactory medical arrangements, and it had been found necessary to limit the operation of the scheme to death and total disablement, excluding partial incapacity due to silicosis—a strange anomaly having regard to the existing law of workmen's compensation. When this Bill was passed, and when the medical organisation had been established, it was the intention of the Home Secretary to proceed with an amending Order to remove the present anomalies.

Coördination of Medical Arrangements.

Clause 2 gave the Secretary of State power to make a general scheme applicable to all the industries to which the liability to pay compensation had been extended for the purpose of coördinating the medical arrangements. It was proposed that the medical arrangements to be embodied in the general scheme should be based on the recommendations of the Silicosis Medical Arrangements Committee appointed by Lord Brentford, and consisting of Dr. Briggs, the Senior Medical Inspector of Factories, Prof. Arthur Hall of Sheffield, and Dr. Coutts of the Ministry of Health. The report of that Committee, presented to Parliament last September, pointed out that the diagnosis of silicosis involved both clinical and radiological examination by competent medical men of wide and practical experience of the disease, and they recommended that medical boards appointed by the Home Secretary, consisting of at least two specially qualified whole-time officers, should form the basis of the medical arrangements, that there should be a medical board with panels set up at different centres, and that the work should be coördinated by a chief medical officer with a central bureau at Sheffield to maintain, as far as possible, uniformity so far as this question was concerned.

National Medical Boards.

They had already established three separate panels at Sheffield, Newcastle, and Bristol, with a chief medical officer at Sheffield. The arrangement worked well, and the Home Secretary proposed, with the assent of the parties interested in the refractory and sandstone industries scheme, to convert the existing medical board into a national board. That would involve a great deal more work, and it would, no doubt, be necessary to arrange for the appointment of additional panels.

Dr. VERNON DAVIES: Will these boards be directly under the factory department of the Home Office?

Mr. SHORT said he thought they would be under the Home Office. It was proposed to set up a medical expenses fund, which would be maintained by fees payable by employers and workers in respect of examinations and by additional grants from the Treasury. The Home Secretary would appoint trustees who would be responsible for the collection of the fees and for the payments in accordance with the scheme. The fees to be paid in respect of examinations and certificates would be fixed by regulations made by the Home Secretary and approved by the Treasury. The Home Secretary would consult employers and workpeople in relation to these fees, and he would not be averse from the appointment of a small advisory committee or council. Powers were given for the enforcement of periodical medical examinations, which the Home Secretary already had power to require in case of particular industries or processes. There were no means at present of enforcing such provisions in relation to employers except in the case of an industry where a trade compensation fund existed. It was desirable that medical examinations should take place at once and periodically if necessary, and that those making the medical examination and called upon to certify should be most competent and have at their disposal all the necessary apparatus. It was not intended that all workers covered by the schemes should be required to be medically examined, but periodical examinations would be made as and when prescribed under the scheme, and only in cases of processes where they were really necessary.

A Report on Asbestos Dust.

The effects of asbestos dust were recently the subject of a very wide and comprehensive inquiry by Dr. Merewether and Mr. C. W. Price, H.M. Inspectors of Factories. Their report was presented to Parliament in March last. They came to the conclusion that the risk of an asbestos worker contracting fibrosis of the lungs, involving in some cases serious disability and in others death, was very great indeed. It was indicated that the proportion of those at work in the sections of the industry considered who were found to be affected by this disease was nearly one in eight. There were only some 2000 workers involved, but the evidence proved that there was a great risk, and that it was essential that something should be done on the lines of this Bill. The same medical arrangements to which he had referred in relation to silicosis were also essential and desirable in this case.

Preventive Work.

Mr. D. HACKING said while he did not oppose the second reading of the Bill he wished to state his belief that a great deal could still be done towards the prevention of this disease. In the main they should concentrate on that side of the case, for prevention was better than permitting the disease and allowing compensation to follow. There were some 70,000 persons engaged in the industries which were subject to silicosis, and 2200 more in those subject to asbestosis. He was not sure that Mr. Short was right in stating that it would not be necessary to have an examination in connexion with them all. He believed that if they were really going to conquer the disease they must have a very full examination of every individual connected with the industry, and that meant that there would have to be an examination carried out by 100 doctors who must not be ordinary doctors but specialists in this disease. That would appear to suggest a very heavy cost, which, if it was laid upon the industries, might be a very serious thing for the employers and employees. If the cost was to be very heavy, he suggested that the Treasury should come to the assistance of the industries and give a substantial grant.

A Government Medical Service.

Dr. VERNON DAVIES said he welcomed the Bill, but he would like the House thoroughly to understand what it meant. The whole success or failure of the Bill would depend on the scheme which the Home Secretary would adumbrate in an Order which would be laid on the Table of the House. If the regulations or the instructions which the Home Secretary made were sufficient, then the procedure would do good, but if they were not sufficient it might do harm. The difficulty that was going to happen under the scheme to be elaborated by the Home Office was the same trouble in regard to attributability that existed at the present time in regard to pension cases. Therefore legislation of this character, though very necessary, had some danger attached to it. It was essential for the success of the Bill and of the scheme that the medical men should be absolutely above suspicion. For that reason he was strongly of opinion that the medical boards should be absolutely under the Home Office, that there should be a Government medical service for these industrial diseases which would command the confidence of the employers, of the workmen, and of Parliament. That would mean that the verdict of these medical men would be decisive. He could assure Mr. Hacking that 100 doctors would not be required, because it would not be necessary to examine all the 70,000 men in the industry in the first year. Six or seven medical boards and perhaps more would be required.

The Bill was read a second time.

HOUSING (SCOTLAND) BILL.

THE Standing Committee of the House of Commons on Scottish Bills again considered, on June 17th, the Housing (Scotland) Bill. Mr. MACPHERSON was in the chair.

Official Representations.

On Clause 29 (which contains provisions with respect to official representations) the Committee resumed consideration of an amendment moved by Mr. Duncan Millar to leave out the provision in Subsection (1) that for the purposes of the Principal Act the expression "official representation" should include, in the case of a small burgh within the meaning of the Local Government Scotland Act, 1929, a

representation made by the medical officer of the county to the County Council, and forwarded by them to the town council of the burgh.

Mr. JOHNSTON (Under Secretary for State for Scotland) said there was a considerable body of opinion in all parts of the Committee which hesitated at accepting these words in Subsection (1), and the suggestion that the Government were prepared to make as a way out of the difficulty was that the words "to the County Council and forwarded by them to the town council of the burgh" should be deleted, and that there should be inserted in their place the words "and forwarded by him to the medical officer of health of the burgh." He said the object was that where there might be a difference of opinion between the medical officer of health of the burgh and the medical officer of health of the county regarding housing or health affairs in the small burgh on some matter which the county medical officer of health had discovered in the course of his investigations inside the burgh, he should not be compelled to report, so to speak, over the head of a medical officer of health for the small burgh, or appear in any way to interfere with the housing rights and duties of the small burgh. The suggestion he made to meet the difficulty was that the county medical officer of health should not make his report to the Department of Health, or to the town council of the small burgh, but that he should make his report to the medical officer of health of the small burgh. He trusted that this proposal for the solution of the difficulty would be generally accepted in all parts of the Committee.

Mr. DUNCAN MILLAR said that the Under Secretary for Scotland had treated this matter as if it related purely to the question of the transferred public health services, but this Bill dealt with slum clearance and improvement schemes in relation to housing, which was a matter over which the burghs had complete control. The issues which the Under Secretary had raised was a separate issue which would be dealt with by a local committee, but Mr. Johnston had not met the point that the local authority in the burgh ought to have complete contact with and control over its own officials, who ought to be directly responsible to it in the matter of official representation. According to the words proposed by the Under Secretary the medical officer of health of the county would make the representation, and the representation would be forwarded by him to the medical officer of health of the burgh.

Mr. JOHNSTON said Mr. Millar was entirely mistaken. Where a burgh appointed a medical officer of health it was the clear duty of that medical officer to report to the burgh, and only to the burgh. Where, however, the medical officer of health to the burgh had not made such a report to his town council, or had been remiss in his duty, and the county medical officer of health discovered some housing matter affecting public health, not only in the burgh but also in the county, it was proposed that it should be the duty of the county medical officer to bring such representations as he might make to the notice of the burghal medical officer of health; but in no sense was it proposed to interfere with the statutory duty of the burghal medical officer to report to his own council in the matter.

Mr. MACROBERT: Is it the position that the medical officer of health of the burgh is in supreme command?

Mr. JOHNSTON: Undoubtedly, in the burgh.

Mr. MACROBERT: And if he gets a representation from the medical officer of health for the county he can veto it? I should not so construe the clause.

Mr. JOHNSTON said that the Government had been legally advised to that effect.

Mr. MACROBERT asked if it was intended that the medical officer of health for the burgh could suppress a representation from the medical officer of health for the county, and not send it to the local authority? If that were so, it was not really an official representation at all; it was worthless unless the medical officer of health for the burgh passed it on.

Dr. HUNTER said that if the Under Secretary for State meant that the county medical officer should report the circumstances of the unsatisfactory houses to the burghal medical officer of health he would be satisfied, but if the Under Secretary meant that the official representation was passed on to the burghal medical officer, and that it should be his duty to hand it over to the town council as if it were a mandate or order from the county medical officer he would not be satisfied. He thought the duty of a county medical officer ended when he discovered unsatisfactory housing and reported the matter.

THE LORD ADVOCATE (Mr. CRAIGIE AITCHISON) said he hoped the Committee would accept the suggestion of the Government. What the clause, if amended as suggested, would provide was that the medical officer of health for the county in the appropriate case would make a representation and forward it to the medical officer of health for the small burgh, and there the matter would end. It was for the burgh medical officer of health to say whether he regarded the representation made to him as having substance or not, and whether he proposed to act on it or upon a view of his own. If they did not leave the matter there the result would be an interference with the powers of the medical officer for the burgh, which was the very thing he understood the Committee were anxious to avoid.

Mr. MACROBERT said that if the representation were not passed on it would be of no avail and would be useless.

THE LORD ADVOCATE said in the case where a representation was not passed on there was nothing in the Bill to prevent the town council of the burgh calling for that representation, and it was very difficult to conceive that such a representation would simply be pigeon-holed. The town council would not be bound to act upon the view of the burgh medical officer; if it chose it could accept the view of the county medical officer.

After further discussion,

Mr. JOHNSTON said it must be apparent to every member of the Committee that there was a difficulty here, and they were not getting nearer to a solution. It was quite clear that the form of words which he had suggested still left untouched the difficulty about "official representation." When a complaint was made by four local government electors it was provided under the clause that it should then be the duty of the medical officer to inspect a house and report to his local authority. The question arose whether a way out of the difficulty could not be found by putting the county medical officer of health on the same footing towards the burgh medical officer of health as the four ratepayers. If such a suggestion met the wishes of the Committee he would give an undertaking on behalf of the Government that the proper form of words should be introduced on the Report stage. In the meantime he was prepared to accept Mr. Millar's amendment on the clear understanding that qualifying words should be inserted at a later stage.

Mr. DUNCAN MILLAR said he was the first to acknowledge the effort which the Under Secretary had made to meet the views of the Committee. He would not like to commit himself to the suggestion that the powers of the burghs should be limited in any respect with regard to housing.

Mr. DUNCAN MILLAR'S amendment was then agreed to.

Mr. JOHNSTON moved an amendment to insert a new subsection, providing as follows:—

"Before making an official representation (other than such a representation for the purpose of section eleven or section thirteen of this Act) the medical officer of health of a local authority shall consult with, or obtain a report from, the sanitary inspector of the authority."

The amendment was agreed to, and Clause 29, as amended, was ordered to stand part of the Bill.

The Committee adjourned.

HOURS OF SHOP ASSISTANTS.

The Select Committee of the House of Commons on the Hours of Shop Assistants heard evidence on June 18th from Mr. J. R. LESLIE, General Secretary of the National Amalgamated Union of Shop Assistants, Warehousemen and Clerks. He said that so far there had been only two measures limiting the working hours of assistants. Long hours behind the counter, worked often in a vitiated atmosphere, had a decidedly detrimental effect on the health of those employed. Over 40 years ago, Dr. Richardson stated that in his opinion eight hours daily was the maximum time during which labour ought to be carried on in shops. Two years ago an ex-army doctor was so impressed by the tired appearance of girls in shops in the south of England that he made personal investigations and approached the Union to see if anything could be done to stop what he considered a blot on our civilisation. At a subsequent demonstration he vigorously denounced the long hours that shop assistants had to endure as being detrimental to their health, and extremely dangerous to young women whose health would probably be impaired for life through long hours of standing. In the recent debate on shop hours in the House of Commons, Dr. Bentham, speaking as a medical practitioner, declared that the health of shop assistants compared extremely badly with that of people in almost every other trade. The Shop Acts made no provision for sanitation, ventilation or other health safeguards as did the Factory and Workshops Acts. In large numbers of cases shop assistants stood almost elbow to elbow behind their counters. Ventilation on any scientific plan was often non-existent, and in thousands of cases no regard was paid to keeping up a reasonable temperature. During winter months the sick benefit paid by the Union's approved society to its members was greatly increased, and was distinctly traceable in great part to the chilling effect of unheated shops. In February of last year, during an extremely cold spell of weather, the sickness ratio rose to the highest peak that their approved society had experienced. In a large number of shops there

were no sanitary conveniences at all. Women were sometimes called on to lift weights which were liable to cause injury. He asked that the Factory and Workshops Acts should be extended to include shops, warehouses and offices, and that the standard set by the Home Office in the case of sanitary conveniences should apply to shops.

The Committee adjourned.

HOUSE OF LORDS.

WEDNESDAY, JUNE 18TH.

FOOD VALUE OF CONDENSED SKIMMED MILK.

Lord CRANWORTH drew attention to the increased importation and consumption of dried and tinned skim milk to the detriment of the market for British-produced whole milk, and asked, in view of its grave effect on the health and physique of the nation, what steps the Government proposed to take in the matter, and moved for Papers. He said that in 1921 the imports of unsweetened whole milk were 612,000 cwt. in round figures, and in 1929 they were 405,000 cwt. The imports of sweetened whole milk in 1921 were 691,000 cwt., and in 1929 258,000 cwt. In 1921 the imports of separated or skimmed tinned milk were 873,000 cwt., and in 1929, 1,988,000 cwt. The figures showed an increase in regular sequence every year, and so far from the position being changed this year there was every reason to believe that at the end of 1930 the imports would exceed 100,000 tons. The production of milk in this country was governed by various milk and dairy orders, which imposed an increasingly rigorous demand on the farmer for a higher and better production of milk. He thought that was right, but was it fair that the British farmer should be saddled with this increased cost of production unless his foreign competitors were saddled with the same cost? As regarded the detriment of these foreign milk imports to the health of the nation, that was, in his view, by far the most important point they had to consider. There was nothing which caused greater anxiety to-day than the deterioration of the national physique. Figures given by the Secretary of State for War in the House of Commons on this matter were very illuminating. Mr. Shaw had stated that out of 72,268 recruits who presented themselves for the line, 61 per cent. were rejected (91 per cent. of them on medical grounds), although in December, 1928, the standard for infantry of the line was reduced to 5 ft. 2 ins., and in the same year the dental standard was lowered. That was a very serious state of affairs. It would, of course, be absurd to suggest that this deterioration in physique was due to the fact that the people of this country consumed tinned skimmed milk in such quantities. The life of the nation had changed. The ancestors of the men of whom he spoke had plenty of regular work, perhaps too much. They had wholesome food; perhaps not enough of it. But they did not live as so many of the population did now, on cheap cigarettes, canned food, and aperients. His contention was that with the new conditions of life to-day, whatever Government was in power ought to see that everything possible was done to preserve the health of the nation. If the Government took account of what was put into the heads of the children to-day, were they to take no responsibility for what those children put into their stomachs? He held in his hand a tin of what he understood was the most popular brand of tinned skimmed milk. On the front of it were the words "Unfit for babies"—not for children, let them note, but for babies. If they placed in a tumbler of water, pure or impure, three teaspoonfuls of the contents of the tin, they got a substance which looked remarkably like milk, and which tasted not so much unlike milk as they might think. It cost 3*d.*, and three teaspoonfuls made half a pint of milk. It would probably last good for a fortnight. Was it surprising that the temptation to use such milk was too great for practically any poor person to overcome? He had an analysis of this substance by a first-rate London analyst, which had not been challenged. It was: specific gravity, 1·34; water, 27·5; total solid matter, 72·5; ash, 2·8; fat, ·65; milk sugar, 13·7; cane sugar, 45·1; protein 10. Therefore he did not say that the mixture was poisonous, or even that it was valueless for certain purposes. But it had no right to be labelled "milk," and it was a monstrous thing that three-quarters of the children of this country should be brought up on this product. It was disgraceful that any Government should countenance such a thing. If he had proved his three points he contended that it was for the Government to suggest a remedy.

Lord HASTINGS said he thought Lord Cranworth had made out an abundant case for investigation from the standpoint of the Ministry of Health.

Lord MARLEY (Under Secretary of State for War) said that the Government had a great deal of sympathy with the case as stated by Lord Cranworth. The Government considered that the use of milk was of immense importance for the maintenance and improvement of the health of the people. They were also in agreement with the object of improving the market for British milk. They recognised that condensed skimmed milk was inferior to whole milk, and might be classified as a second-class food. But he did not think that it was possible to prohibit the import of a food merely because it was second class.

Lord CARSON: But is this substance we are talking about milk? I understood Lord Cranworth to point out that it was not milk at all.

Lord MARLEY said that condensed skimmed milk was whole milk from which the fat had been removed as well as part of the water, and to the remainder sugar was added. The composition of an ordinary tin of milk was 26 per cent. of milk solids, 45 per cent. or thereabouts of cane sugar, and 34 to 29 per cent. of water. The sugar, of course, was an addition. The dried milk to which reference had been made was milk from which not only all the fat, but practically all the water, had been removed, and it consisted of 95 per cent. of milk solids and a very small residuum of water. The milk solids consisted of non-fatty solids of considerable biological value. They included lactose—i.e., milk sugar—mineral matter and other substances. A Commission was sent to Holland and Denmark to ascertain the conditions of production, and they had reported that the conditions of production were at least as good as the conditions in this country. They also found that the cowsheds in Holland were in many cases better than the cowsheds in England. The only dietetic objection to condensed skimmed milk was that there was an absence of fat products, and the same objection applied to many other foods. Adequate steps had been taken to guard against the danger of the use of this condensed skimmed milk by ignorant people in the belief that they were using whole milk. It was a curious fact that while the consumption of condensed skimmed milk had increased, at the same time the general health of the nation had improved. The annual death-rate, which averaged 15·4 per 1000 from 1901 to 1910, had been reduced to 14·3 per 1000 from 1911 to 1920, and was further reduced to 12·2 from 1921 to 1929. But what was still more important was that the infant mortality-rate had improved enormously. It averaged 128 per 1000 from 1901 to 1910, was reduced to 100 per 1000 from 1911 to 1920; and was further reduced to 73 per 1000 in the period from 1921 to 1929. Furthermore, recently, owing to the extension of the school medical service it had been found that the general health of school children—their weight, their measurements, their height—had shown a steady improvement during the last ten years. From experiments carried out by the Scottish Board of Health, in which they took a number of groups of children of various ages, and added to their normal diet certain additional diets of various kinds of milk, it had been found that although, in the case of six-year-old children, whole milk was significantly superior to skimmed milk, yet skimmed milk itself was an extremely valuable food. In children above six there was no significant difference between those children who received whole milk and those children who received skimmed milk. Dried skimmed milk, when reconstituted with water, was practically the same as boiled skimmed milk, and therefore they could say that dried skimmed milk had about the same food value as boiled skimmed milk. It might be said that condensed skimmed milk was better than badly produced unsound whole milk. He entirely agreed that if infants were going to suffer they must do more than they had done, but the words "Unfit for babies" were very clearly printed on all the tins. There was very little evidence that this substance was used for the feeding of infants. The main reasons for using this kind of milk were undoubtedly ignorance and poverty, and perhaps, therefore, the best attack on the misuse of this milk was an attack on poverty and bad housing. He did not pretend for a moment that whole milk was not far better as a food than condensed skimmed milk. This country consumed far too little whole milk. The consumption in England was ·4 of a pint per head per day; in the United States the figure was 1 pint a day; in Norway, 1·1 pints; in Denmark, 1·2 pints; and in Switzerland, 1·8 pints. The Government were giving full support to the work of the National Milk Publicity Council. That Council devoted itself to the advertising of whole fresh milk, and had conducted a scheme which this year was estimated to supply 4,000,000 gallons of fresh milk to school children. Many local education authorities were advertising milk and supplying it, and in Scotland the Empire Marketing Board was feeding thousands of school children on milk with the aid of a grant. Personally he (Lord Marley) would like to see a large extension of the supply, and advertising of whole milk by local education authorities, child welfare centres, and nursery schools. The prohibition of importation as a means of helping agriculture was a policy which had not been adopted by previous Governments, and could not be adopted by the present Government. It would have the effect of raising prices, and might very well

fail to cause an increase in the consumption of whole milk; while it might cause an increase in the consumption of foods even less desirable than condensed skimmed milk. Therefore he suggested to their Lordships that there was no justification on grounds of health for departing from the policy of previous Governments of allowing the unrestricted import of these milk products.

After further discussion, Lord CRANWORTH withdrew his motion for Papers.

HOUSE OF COMMONS.

WEDNESDAY, JUNE 18TH.

Fatal Accidents in Coal Mines.

Mr. MARDY-JONES asked the Secretary for Mines the total number of deaths from accidents in coal mines in Great Britain for the year 1929; and the total number of deaths due to accident under each of the following heads during 1929, and the percentage of each to the total death-roll, namely: explosions by firedamp, falls of roof and side, in shafts, and miscellaneous (underground) and miscellaneous (surface).—Mr. PARKINSON (Lord of the Treasury) replied: The following is the information asked for:—

Place or cause of Accident.	Deaths from accidents at mines under the Coal Mines Act in 1929.	
	Number.	Percentage proportion of total number of deaths.
Explosions of firedamp or coal dust	34	3·2
Falls of roof and sides ..	581	54·0
Shaft accidents	41	3·8
Haulage accidents ..	220	20·4
Other underground accidents	120	11·2
Surface accidents	80	7·4
Total ..	1,076	100·0

Treatment of Cancer.

Mr. MILLS asked the Minister of Health if, seeing that 51,000 people died of cancer in the year 1928–29, but that only 550 beds were available, and these secured according to means by patients from all parts of the Empire, he would state what financial assistance was given by the State.—Miss LAWRENCE (Parliamentary Secretary to the Ministry of Health) replied: No financial assistance is provided from the Exchequer for the provision of beds for the special treatment of cancer, but I may remind my hon. friend that Parliament has voted £100,000 towards the provision of radium. I should add that the figure of 550 beds mentioned in the question is presumably an estimate of the number of beds available only in those hospitals which are devoted wholly or mainly to the treatment of cancer, but it will be understood that the majority of cancer patients who are treated in hospital are admitted to general or public authorities' hospitals.

Mr. MILLS: Is the Parliamentary Secretary aware that the vast majority of these beds in hospitals at the moment are still subject to the means test, under which something has to be paid, and that consequently thousands of cases have to go by default for lack of the necessary help by the Government?

Dr. VERNON DAVIES: Is the hon. lady aware that at no hospital in the kingdom is a cancer case refused admission if any treatment can be given for its good?

Earl WINTERTON: May I, as chairman of a hospital, ask the hon. lady if she will give a reply to the monstrous suggestion made by the hon. Member (Mr. Mills), that cases are refused by voluntary hospitals on a means test? As chairman of a hospital I greatly resent that suggestion.

Miss LAWRENCE was understood to reply that she could not answer that question without asking for further details.

Mr. MCSHANE: Is it not a fact that numbers of people who know that they will be expected to pay something when they get into the hospital are in that sense deterred from entering the hospital?

Viscountess ASTOR: Is it not the fact that a great many people are willing to pay for treatment if they can get into a hospital? It is not that hospitals will not take them, but they cannot get in because there are not sufficient hospitals.

No answers were given.

All-India Medical Council.

Major GRAHAM POLE asked the Secretary of State for India whether it was the intention of the Government of India to introduce the necessary legislation for the setting up of an all-India medical council during the next session of the Indian Legislative Assembly.—Mr. WEDGWOOD BENN replied: I have ascertained that it is not the intention of the Government of India to introduce legislation on the subject during the next Assembly session, as that session will be a very short one. It would not be possible to complete the different stages through which such a legislative measure is expected to pass before the dissolution of the Assembly. The Government of India, however, have convened a conference which Ministers in charge of medical administration, heads of medical departments and representatives of medical faculties of Universities have been invited to attend, in order that the principles of the proposed legislation may be settled. The agreement of Provincial Governments and the Universities would then be invited. This conference, which will meet on the 23rd June, is expected to discuss all matters arising out of the temporary suspension of the recognition of Indian medical degrees by the General Medical Council.

THURSDAY, JUNE 19TH.

The Annual Holiday Bill.

Mr. WINTERTON asked the Minister of Labour whether returns were now available relating to the promised inquiry as to the effect of an Annual Holiday Bill; and whether she would circulate the replies from the organisations which had been consulted.—Miss BONDFIELD replied: During the second reading debate on my hon. friend's Bill certain important questions were raised. These have since been the subject of examination and informal discussion with industrial representatives, from which it is clear that further consultation with the Trades Union Congress General Council and the National Confederation of Employers' Organisations is necessary in order to bring any proposals for compulsion into proper relation with the voluntary agreements already in existence, and to take into account the various circumstances which need to be considered. I propose to enter into such consultation immediately.

Physical Inspection in Schools.

Mr. DAY asked the President of the Board of Education the number of inspectors of physical training at present employed by his Department; and the average number of visits paid by these inspectors to elementary schools, secondary schools, and training colleges.—Sir CHARLES TREVELYAN replied: The number of inspectors of physical training employed under the Board of Education is 10. During the year ended 31st December, 1929, they paid 561 visits to elementary schools, 357 to secondary schools, and 137 to training colleges. As regards elementary schools, it must be understood that the time of these officers is largely devoted to inspecting and advising upon the organisation of the instruction in physical training generally in the areas of local education authorities, rather than to the inspection of individual schools.

Medical Examination of Civil Service Clerks.

Sir WALTER DE FRECE asked the Secretary to the Treasury the total number of P-class clerks in the Civil Service rejected outright on medical grounds after success in the Lytton or Southborough examination and who had not been promoted to the clerical class or to one of the departmental clerical classes in an unestablished capacity; and, if available, the number of such officers in each department.—Mr. PETHICK-LAWRENCE (Financial Secretary to the Treasury) replied: The total number of P-class clerks rejected on medical grounds after success in the Lytton-Southborough examinations was 222. I am aware that of this number, 37 subsequently received promotion to the clerical classes, but it would not be possible, without disproportionate expenditure of time and labour, to ascertain how many of the remainder are still in the Government service, and the capacity and the departments in which they are employed

MONDAY, JUNE 23RD.

Sick Leave among Post Office Sorters.

Sir WALTER DE FRECE asked the Postmaster-General the average amount of sick leave for sorting assistants and supervisors of sorting assistants, respectively, in each of the last two years.—Mr. H. B. LEES-SMITH replied: The average sick leave of sorting assistants in the Post Office during the years 1928 and 1929 was 11·5 days and 14·5 days, respectively. The average sick leave of supervisors of sorting assistants was 13·7 days in 1928 and 22·1 days in 1929.

Correspondence.

"Audi alteram partem."

THE CAUSATION OF ECLAMPSIA.

To the Editor of THE LANCET.

SIR,—I wonder whether I might ask Mr. Paramore to be kind enough to re-read the summary of my paper? My letter on p. 1264 of your issue of June 7th was in answer to specific questions raised by himself. The children of Israel could not make bricks without straw, neither can the liver defend the body against toxins without the requisite chemicals. I do not believe the liver fails because it is overworked but because it has not got the substances, of which ionised calcium is the most important, with which to work. Once the defence is broken down the intestinal toxins damage the liver so that it is no longer able to carry out its functions. The fits may, I believe, be caused in at least three different ways, as I described in my paper. The amount of toxins which circulate in the blood stream will depend on several factors, such as the diet taken by the patient, the degree of intestinal stasis present, and the treatment carried out. In mild cases the toxins damage the liver but do not, I think, enter the blood stream in any marked concentration. The fits in such a case are probably caused by a sudden drop in the level of the blood-sugar in association with a hypocalcæmia. In severe cases the toxins from the intestines enter the blood stream in considerable amounts and poison the whole body. The fits in such cases may be caused in one of the three ways mentioned, or by a combination of all three. Few physicians will agree with the views attributed by Mr. Paramore to Stroganoff that the violence of the fits can damage a healthy heart. Many women die from eclampsia after a very few fits, and some die in coma without suffering from convulsions. On the other hand, von Jardini has recorded the case of a woman who recovered after 207 fits. I do hope I have made it clear to Mr. Paramore that the significance of the failure of the defence is that the attacking force—the intestinal toxins—may do their damage. The first organ the toxins damage is the liver.

Mr. Paramore writes: "if the fœtal demands should become too great for the mother, fœtal atrophy, not a maternal disaster, should occur." This belief is, I am sure, contrary to facts. The mother will continue to supply the wants of the fœtus to the jeopardy of her own life. He asks "how is it that in China, where osteomalacia is common, eclampsia is rare." As a matter of fact, osteomalacia occurs in Northern China where eclampsia is common, but not in Southern China or Indo-China where eclampsia is uncommon. I am certainly surprised that he refers to the association of hydatidiform mole with eclampsia, as he has been asked more than once to explain this association in the light of his hypothesis. I should, however, like to ask him for references to undoubted cases of eclampsia occurring in association with hydatidiform mole, which have been reported during the last 15 years.

I claim that the intra-abdominal pressure is slightly less than that of the atmosphere when the woman is lying flat on her back under an anæsthetic, whether she be virgin, pregnant, or possessing a large abdominal tumour. The intra-abdominal pressure obviously varies with posture, but I am not prepared to believe, without demonstration, that it is altered either by an ovarian tumour or by pregnancy. I do agree with him that the bulk of the uterus does seriously embarrass the intestines. Mr. Paramore states with assurance that the injection of saline or air into the udder of a cow affected with *l'éclampsie vitulaire* does not cure the animal by raising the blood-calcium, but does not trouble to explain how Prof. J. Russell Greig has succeeded in curing 24 cows suffering from this complaint by intravenous and subcutaneous injections of calcium gluconate. Dr. Eardley Holland, in discussing my paper at the Royal Society of Medicine, reported two cases of acute yellow atrophy of the liver which recovered after the intravenous administration of calcium gluconate.

I am sorry that Dr. Chapman pays more attention to my letter in reply to certain questions than to my original paper. Ovarian tumours frequently limit the movements of the diaphragm but never cause eclampsia. I have already referred to some of the points he has raised, but I should like to assure him that the psychological traumata associated with marriage, pregnancy, and the first confinement were not introduced as "make-weight," for I believe that it will be increasingly recognised that such traumata not infrequently lead to metabolic disturbances of the body.

Mr. Paramore dislikes my bridge and states that it is one over which scientific thought cannot pass. I am prepared to await the verdict of time, and can honestly say that I hope it will soon be destroyed if it is not built on a sure foundation. The bridge may not be of much service to eclamptic women, but it can save pregnant women from eclampsia. I hope that I may be spared to see the day when eclampsia will be as rare in England as is typhus, and this happy result may, I believe, be achieved by attention to the hygiene and diet of pregnant women. Does Mr. Paramore believe that eclampsia can be eliminated; if so, how? It is on results that I would wish my hypothesis to be judged.

I am, Sir, yours faithfully,

G. W. THEOBALD.

London, W., June 24th, 1930.

TRICHINA AND CYSTICERCUS.

To the Editor of THE LANCET.

SIR,—In 1926[1] I published with Dr. H. K. Graham-Hodgson a case of verruca necrogenica treated with ultra-violet radiation and associated with numerous calcified parasites. We had suggested that the parasite was *Trichina spiralis*. At the April meeting of the Tropical Section of the Royal Society of Medicine I showed a similar case and again suggested that the infection was due to trichinosis. Prof. Leiper pointed out that the case was one of infection with *Cysticercus cellulosæ*. After the meeting he very kindly arranged with Sir Arthur Keith for me to X ray specimens of trichinosis from the Royal College of Surgeons collection. The calcified cysts of the *Trichinosis spiralis* showed up as minute specks, and although detectable in prints, would be lost when reproduced for publication. The cyst of the *Cysticercus cellulosæ* is about $\frac{1}{4}$ in. long.

I am, Sir, yours faithfully,

London, W.1. M. WEINBREN.

DIAGNOSIS OF ENTERIC INFECTION.

To the Editor of THE LANCET.

SIR,—Dr. Lowe's remarks on the Widal reaction will be most interesting and valuable to clinicians and others like myself who have been taught to believe that a positive reaction means enteric and a negative reaction means no enteric—with very rare exceptions. This is an axiom which I have tried to show is extremely dangerous. Dr. Lowe's letter puts quite a different complexion on the value of the test to what is usually understood by many. Blood culture has not been successful with me, but I will certainly try it out on the lines he indicates.

I am, Sir, yours faithfully,

E. THORP,

Deputy Medical Officer of Health, Sunderland.

June 18th, 1930.

[1] THE LANCET, 1926, ii., 174.

LEFT INFRAMAMMARY PAIN.

To the Editor of THE LANCET.

SIR,—I have read Dr. Baker's article and the letters of Sir Charlton Briscoe and Dr. Garvie on this subject with much interest. Having been for long connected with the National Hospital for Diseases of the Heart, I have been confronted with a great number of cases of pain in the cardiac region, each of which called for a thorough examination before a satisfactory diagnosis could be reached. It must always be borne in mind that diagnosis without subsequent relief of suffering gives but poor satisfaction to the patient. It is therefore important that, if possible, immediate relief should be given while at the same time the cause of the pain is being treated. Although the left inframammary pain referred to may be of cardiac origin this is by no means the rule. I have come across many cases where digitalis or amyl nitrate have been prescribed without benefit simply because the pain was extra-cardiac in origin and the vascular system healthy. Experience has shown that intercostal rheumatism or neuralgia are, as Sir Charlton Briscoe pointed out, frequently the seat of the trouble. Moreover, since the pain is often acute, relief is urgently called for.

I have found the following plan very successful in the treatment of the immediate symptom of pain in the præcordial region, in the absence of heart disease. The extended right hand is placed over the area of pain and gradually increased pressure made. The patient is then asked to take a deep breath and to make movements calculated to provoke the pain. If, as often happens, more or less relief of pain is attained, limitation of movement of the ribs over the affected area is indicated. The patient's chest is exposed and a measurement taken from the back at the level of the fifth or sixth spine round to sternal line and strips of plaster 2 in. wide are cut. The patient fixes his body by placing his left hand firmly on the mantelpiece or some similar object; the doctor then fixes one end of the strip of plaster on the spine with his left hand round the patient's waist, and while still holding the plaster in position, pulls it round with his right hand to the front of the chest, exerting pressure all the time; about three or four strips are required. The straps may remain on for two or three weeks. When pressure on a particular spot on the spine causes the pain a small blister placed there is often efficacious. When the pain arises from patch of adherent pleura strapping is useful. I am, Sir, yours faithfully,

CHARLES W. CHAPMAN.

London, W., June 24th, 1930.

PATENTS FOR FINE CHEMICALS.

To the Editor of THE LANCET.

SIR,—In his address to the Society of Chemical Industry annotated in your issue of April 19th (p. 871) Mr. F. L. Pyman, F.R.S., discussed various imperfections of the British patent system, with particular reference to the disadvantages arising from the fact that, owing to the ethical views prevalent in British medical circles, chemico-pharmaceutical and therapeutically important medical inventions are not patented by the inventors. He pointed out that this state of things is economically unsound from a national point of view, since it leaves it open to foreigners to monopolise British inventions by patenting improvements thereon. As a case in point, he cited "the brilliant work of Harington and Barger in determining the constitution and the synthesis of thyroxin" and the monopoly which a Swiss firm had acquired by securing British Patent No. 318,582 for an improvement on the novel, but unpatented, method of synthesising thyroxin adopted by Harington and Barger.

We are authorised to make the following statement on behalf of Messrs. F. Hoffmann-La Roche and Co., A.G., of the "Roche" Research Laboratories, Basle, Switzerland, the holders of the patent in question. They write: "Apart from the question of the actual value of the process covered by our patent, it is quite certain that, compared with Harington's fundamental invention, it is of minor importance. By taking out this patent, we aspired to no monopoly. We merely wished to manifest to the outer world that our laboratories had been successful in improving the method. In order, however, to avoid any misconstruction of our intentions, and in view of Pyman's arguments, we have decided to relinquish our claim to the patent and thus to allow our process to become general property." We beg you to give this friendly and open-handed gesture on the part of our Swiss friends the publicity it deserves.

We are, Sir, yours faithfully,

THE HOFFMANN-LA ROCHE CHEMICAL WORKS, LIMITED.

London, N., June 18th, 1930.

TREATMENT OF G.P.I. BY INJECTION OF SULPHUR.

To the Editor of THE LANCET.

SIR,—Reference to your issue of August 22nd, 1925 (p. 408), reveals the fact that I was the first physician to suggest the treatment of G.P.I. by injection of sulphur. Nearly six years ago I drew the attention of the medical profession through the pages of THE LANCET to the advantages of sulphur therapy and recommended it to replace malaria therapy. Unfortunately no mention is made of my name by either Dr. Knud Schroeder or Dr. Noel J. Harris in their papers.

I am, Sir, yours faithfully,

DJAMIL F. TUTUNJI, M.D.

Palestine, June 11th, 1930.

*** In the letter we published in 1925 Dr. Tutunji suggested that the remissions obtained with malario-therapy are due simply to changes of the body temperature. He said he had observed symptoms resembling malarial rigor after injection of colloidal sulphur, and concluded his letter as follows: "I am sorry I have not yet met any case of dementia paralytica through eight years practice of the profession. This may be due to the fact that malaria is endemic in this country (Palestine) and syphilis comparatively rare. I shall be very grateful to any member of the medical profession who will test the use in appropriate cases of colloidal sulphur in this way, and will communicate the results through the pages of THE LANCET."—ED. L.

NOISE IN HARLEY STREET.

To the Editor of THE LANCET.

SIR,—Cannot something be done to lessen or mitigate in some degree the hideous noise that is being made in connexion with a building that is being erected at the north end of Harley-street? Every device for making a noise appears to have been adopted in connexion with the erection of this building, and when telephoning with my windows open it is almost impossible to hear one's interviewer. Sundays also have been used for the purposes of making more noise. I am, Sir, yours faithfully,

A. RALPH THOMPSON, F.R.C.S.

Harley-street, W., June 24th, 1930.

SCARCITY OF DISTRICT NURSES.—At a meeting of the executive committee of the Queen's Institute of District Nursing last week it was stated that the present supply of nurses is insufficient to meet the demands from all over the country for Queen's nurses. Careful consideration is being given to the means of attracting an increased number of nurses to take up work under the institute. Since the committee's last meeting 105 names have been placed on the roll and ten nursing associations have been affiliated.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates passed in ;—

Surgery.—F. R. Crookes, Oxford and Sheffield ; H. J. Hale, Liverpool ; J. Irger, Univ. Coll. Hosp. ; and C. Seeley, St. Mary's Hosp.

Medicine.—G. T. W. Cashell, King's Coll. Hosp. ; L. P. Clarke, St. George's Hosp. ; F. R. Crookes, Oxford and Sheffield ; H. G. Edmunds, Univ. Coll. Hosp. ; I. F. W. Edwards, St. Mary's Hosp. ; H. Glynn, Charing Cross Hosp. ; H. J. Hale, Liverpool ; E. Lethem, Guy's Hosp. ; E. H. W. Lyle, King's Coll. Hosp. ; and A. W. B. Wiggins, Sheffield.

Forensic Medicine.—F. R. Crookes, Oxford and Sheffield ; R. P. Davies, London Hosp. ; H. J. Hale, Liverpool ; J. E. R. Heppolette, St. Mary's Hosp. ; K. V. B. Pillai, Manchester ; E. M. M. Shaw, Westminster Hosp. ; and G. Wilsker, Liege and Royal Free Hosp.

Midwifery.—V. J. H. Coidan, Beirut and Charing Cross Hosp. ; F. R. Crookes, Oxford and Sheffield ; H. J. Hale, Liverpool ; K. V. B. Pillai, Manchester ; E. M. M. Shaw, Westminster Hosp. ; I. J. Todd-Naylor, King's Coll. Hosp. ; and I. M. Williams, Edinburgh.

The Diploma of the Society was granted to the following candidates, entitling them to practise Medicine, Surgery, and Midwifery :—L. P. Clarke, V. J. H. Coidan, F. R. Crookes, I. F. W. Edwards, H. J. Hale, E. Lethem, E. M. M. Shaw, and A. W. B. Wiggins.

QUEEN'S UNIVERSITY, BELFAST.—At recent examinations the following were successful :—

M.D.

*P. A. Clearkin, *R. J. Spence, †Eileen O. Bartley, †Rachel A. Elliott, C. T. Andrews, J. H. Beverland, T. J. Cordy, S. H. Faulkener, G. M. Frizelle, Archibald Fullerton, W. M. M'Kinney, Charles M'Shane, P. J. O'Dowd, J. C. Ramsay, F. W. Vint, and Thos. Walker.

M.CH.

R. J. C. Maxwell.

M.B., B.CH., B.A.O.

First-class Honours.—J. A. Corkey, J. G. M'Gill, and R. J. W. Withers.

Second-class Honours.—J. D. Boyd, James Carson, Alfred Dornan, J. A. Fisher, J. H. Gillespie, Kennedy Hunter, W. R. M. Morton, R. W. M. Strain, and W. M. Turnbull.

Pass.—Vera E. M. Adams, Hamilton Bell, Jairam Bissenar, W. B. F. Brennan, W. D. Calderwood, S. J. Campbell, Maude P. S. Clarke, H. B. Collins, D. J. G. Dawson, Sheelagh B. Deeny, J. G. Devlin, Smyth Governor, Arthur Greenhalgh, W. I. Hardy, H. S. A. Henry, Martha E. Hutchinson, Aileen M. Kennedy, Amelie Loewenthal, W. K. M'Collum, W. L. M'Cracken, Mary H. M'Lean, R. A. N. M'Math, J. A. M'Vicker, William Manwell, D. M'V. Morrison, J. J. Rippey, J. A. Smiley, R. P. Smyth, C. E. E. Stevens, Jane Sutherland, N. J. Townsley, and Samuel Wallace.

* With gold medal.
† With commendation.

UNIVERSITY OF LONDON—At a meeting of the Senate on June 18th Mr. J. Scott Lidgett, D.D., was elected Vice-Chancellor for 1930–31.

Dr. C. Cyril Okell was appointed to the University chair of bacteriology tenable at University College, London.

ROYAL COLLEGE OF PHYSICIANS, EDINBURGH.—The Victoria Jubilee Cullen Prize for 1930 has been awarded equally between Dr. George Matthew Robertson, physician-superintendent of the Royal Hospital, Morningside, Edinburgh, and Sir Andrew Balfour, Director of the London School of Hygiene and Tropical Medicine.

HOSPITALS AND ROAD CASUALTIES.—The Worcestershire Motor Club, acting in conjunction with the Auto-cycle Union, has devised a scheme for remedying the loss to hospitals caused by the treatment of motoring casualties, whereby a donation on a fixed scale of payment will be made to any hospital affording treatment to a member of the club. The scheme is that the club may pay a capitation fee per member to an insurance company, which in turn contracts to pay any hospital treating a member who is a victim of a motor accident, on the following scale : Patient not detained, 7*s.* 6*d.* ; one day, 10*s.* 6*d.* ; three days, £1 11*s.* 6*d.* ; a week, £3 3*s.* ; two weeks, £5 5*s.* ; up to five weeks, £10 10*s.* ; up to ten weeks, £15 15*s.* It is hoped that other clubs will adopt the scheme.—The governors of the Royal Salop Infirmary, which last year treated 75 road accident cases at a cost of £987, of which only £99 was recovered, have decided that in future if the victims of accidents of this kind "will not acknowledge their indebtedness to the hospital by at least making known their ability or inability to recover the account, the hospital will not hesitate to take any necessary steps to recover the amount."

WESTMINSTER HOSPITAL MEDICAL SCHOOL.—The annual dinner of past and present students will take place at Grosvenor House, Park-lane, W., at 7·30 P.M., on Wednesday, Oct. 1st. Dr. S. E. Dore will preside.

ROYAL INSTITUTE OF PUBLIC HEALTH.—The German Government and the municipality and University of Frankfurt have invited the institute to hold its International Congress at Frankfurt in May, 1931. The invitation has been accepted. This will be the first Congress of the Institute to be held in Germany since 1912.

CONGRESS ON HISTORY OF MEDICINE.—The eighth International Congress on the History of Medicine will be held at Rome from Sept. 22nd to 27th, under the patronage of the King of Italy, and the presidency of the Head of the Government. Individuals, bodies, and institutions associated with medicine in this country are invited to participate, and information may be had from the general secretary, Dr. F. Rocchi, in Rome.

A BOLTON NURSING HOME.—Last week the Haslam Nursing Home at Bolton was opened by Mr. Robert Haslam, who also unveiled a tablet recording that the institution was "built and equipped through the generosity of the Haslam and Scott families, descendants of John Haslam 1771–1820, founder of the firm of John Haslam and Company of this town." A private residence has been adapted as administrative quarters, and a one-storey sun-trap building has been added for the accommodation of 22 patients in single rooms and eight in two four-bed wards. The beds are available at 4 guineas each per week in the wards, and from 7 to 12 guineas per week in private rooms.

THE USE OF RADIUM.—The Glasgow and West of Scotland Radium Institute and the new nurses' home of the Glasgow Royal Cancer Hospital were both formally inaugurated last week, the institute being opened by Principal Rait, of Glasgow University, and the nurses' home by the Duchess of Montrose.—The first annual report of the Nottinghamshire Cancer Campaign Council states that between the end of October and the end of May last 162 cases of cancer were treated with radium, most of them at Nottingham General Hospital. "Most of the patients," the report says, "have been considerably relieved of many of their distressing symptoms, and there is every reason to hope that some are definitely cured." It is proposed to purchase a deep X ray therapy plant as an adjunct to the radium treatment. The idea of eventually making Nottingham the centre of a radium institute to cover the East Midlands, embracing the counties of Nottingham, Derby, Leicester, Lincoln and Rutland, is being considered.

HARVEIAN SOCIETY OF LONDON.—Mr. Montague Smith, the President, took the chair at the Buckston Browne annual dinner of this Society, held at the Connaught Rooms on June 13th. The attendance of members was large, and numerous guests enjoyed a bountiful hospitality. Of these it fell to Sir Farquhar Buzzard to propose the health of the Society, which was, he said, in an interesting physical condition. A happy event could be predicted with confidence for next June, the infant being the Society's centenary. He offered his congratulations on 99 years' successful gestation. The Harveian Society was representative of many whose useful function it was to be continuation schools of the profession. To show how necessary it was to have such schools he quoted extracts from the answers given by candidates in the final test of an (unnamed) examining body. In his reply the President said that attendance at the meetings during the past year had been very good, and the clinical meetings at various hospitals had been especially successful. The number of members was now 369 and he appealed to them to honour the Society's undertaking to raise 400 guineas to furnish bells for the new tower of Hemel Hempstead Church which was being put up as a memorial to William Harvey. Fifty guineas had been voted from the funds. Dr. Tom Hare, professor of pathology at the Royal Veterinary College, in proposing "The Guests," suggested that it would benefit both medicine and horse-breeding if horses were to race under the names of prominent members of the profession. Prof. W. Blair Bell in his reply referred to Prof. Hare's work and spoke warmly of the value to medicine of comparative anatomy and pathology. As first president of the British College of Obstetricians he rebutted the two arguments of the college's critics : (1) Why hadn't it been founded before, and (2) why had it been founded at all? The Rev. Paul Nichols, and Dr. F. J. McCann, president of the Chelsea Clinical Society, also responded to the toast. In the intervals Mr. Sterndale Bennett entertained the company with songs.

STATE AID FOR INVERNESS NORTHERN INFIRMARY.—When the Prime Minister recently unveiled at the Northern Infirmary, Inverness, a scroll containing the first of a series of lists of subscribers to the reconstruction fund, he announced that the Government are prepared to consider sympathetically and favourably the making of a grant from the Highlands and Islands (Medical Services) Fund. The grant is to be in aid of the special expenditure incurred in reconstructing the infirmary so that it may meet modern needs. The amount and form of the grant have not yet been decided.

MELBOURNE HOSPITAL CLINICAL REPORTS.—The Melbourne Hospital will publish biennially the discussions held at special meetings, to consider medical and surgical problems of particular interest and importance, as the "Melbourne Hospital Clinical Reports." It has been the custom for the opener of each discussion to analyse the hospital records of his subject, and to point out how improvement in these results might be obtained. Original papers on scientific and historical subjects and case reports, together with reports of interesting specimens by the pathological staff, will be included. The first number of this new journal will be published very shortly by W. Ramsay, publisher, 233–35, Lonsdale-street, Melbourne, at the price to subscribers of 10*s.* 6*d.* per annum, or 6*s.* per single copy.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, June 30th, to SATURDAY, July 5th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Special M.R.C.P. Lecture on Tues. at 8.30 P.M. by Dr. W. J. Adie on Diseases of the Nervous System (III.).—10, BEDFORD-SQUARE, W.C. Special M.R.C.P. Lecture on Fri., at 8.30 P.M., by Dr. A. Knyvett Gordon on the Diagnosis and Treatment of Certain Bacterial Infections, illustrated by epidiascope, followed by a laboratory demonstration.—ROYAL EAR HOSPITAL, Huntley-street, W.C. Demonstration in O.P. Dept. by Mr. Herbert Tilley at 9 A.M. on Tues. No fee.—HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W. Demonstration in O.P. Dept. by Dr. D. McAlpine at 2 P.M. on Tues. No fee.—ST. MARK'S HOSPITAL, City-road, E.C. Special Course in Proctology. All day for one week.—BABY WEEK Course consisting of demonstrations at various hospitals.—Further particulars from the Fellowship of Medicine, 1, Wimpole-street, W.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, June 30th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY, July 1st.—2.30 to 5 P.M., Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat, and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M., Medical, Surgical, and Children's Diseases Clinics. Operations.

NATIONAL ASSOCIATION FOR PREVENTION OF TUBERCULOSIS.

THURSDAY and FRIDAY.—July 3rd and 4th.—10.30 A.M. daily (at British Medical Association House, Tavistock-square, W.C.), Annual Conference.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.

TUESDAY, July 1st, to FRIDAY.—10 A.M. daily (at Sir W. Dunn School of Pathology, Oxford), Annual Meeting.

Appointments.

MURRAY, J. D. R., M.B., B.Chir. Camb., has been appointed Certifying Surgeon under the Factory and Workshop Acts for Exmouth.

Queen Charlotte's Maternity Hospital: FLEW, J. D., L.R.C.P. Lond., M.R.C.S., Senior Resident Medical Officer; HATRICK, J., M.B., B.S., Assistant Resident Medical Officer.

Stoke Park Colony, Bristol: BERRY, R. J. A., M.D. Melb., F.R.C.S. Eng., Director of Medical Services; NIXON, J. A., M.D. Camb., F.R.C.P. Eng., Consulting Physician; GROVES, E. W. HEY, M.S. Lond., F.R.C.S. Eng., Consulting Surgeon; HALL, I. WALKER, M.D. Manch., Consulting Pathologist and Bacteriologist; ILES, A. E., M.B. Lond., F.R.C.S. Eng., Consulting Oculist; JAMES, J. ANGELL, Jr., M.D. Brist., F.R.C.S. Eng., Consulting Laryngologist; and WANSBROUGH, T. B., M.B., Ch.B. Brist., D.M.R.E., Consulting Radiologist.

Vacancies.

For further information refer to the advertisement columns.

Bath, Royal United Hospital.—H.P. £120.
Bath, Somerset and Wilts Central Children's Orthopædic Hospital, Coombe Park.—H.S. At rate of £120.
Bethnal Green Hospital, Cambridge-road, E.—Asst. M.O. £400.
Birmingham, Highbury Hospital, Moseley.—Res. Asst. M.O. £300.
Birmingham, P.H. Dept., Tuberculosis Section.—Temporary Asst. M.O. 7 gns. weekly.
Birmingham, Selly Oak Hospital.—Surgeon. £700.
Blackburn Royal Infirmary.—Res. H.P. £175.
Bolingbroke Hospital, Wandsworth Common, S.W.—Res. M.O. chiefly Surgical. £200. Also H.P. At rate of £120.
Bolton County Borough.—Asst. M.O.H. and Asst. School M.O. £500.
Bournemouth County Borough, Malvern and Winton Infant Welfare Centres.—Medical Attendant. 11½ guineas per session.
Bristol Royal Infirmary.—Hon. Reg. to Ear, Nose and Throat Dept. Also Hon. Asst. Radiologist.
Cambridge, Papworth Village Settlement.—H.P. At rate of £100.
Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Sen. and Jun. H.S. £120 and £100 respectively. Out-Patient O. £200.
Central London Throat, Nose and Ear Hospital—3rd Res. H.S. At rate of £75.
Chesterfield, North Derbyshire Royal Hospital.—H.S.'s. At rate of £100 to £175.
Colindale Hospital, Hendon, N.W.—Sen. Asst. M.O. £650.
Derby, Derbyshire Royal Infirmary.—Ophth. H.S. £150.
Doncaster Royal Infirmary.—Three H.S.'s and One H.P. All at rate of £150.
Dudley, Guest Hospital.—Asst. H.S. £150.
Edinburgh Royal Infirmary.—Med. Reg. for Statistical Research. £250.
Egyptian University Faculty of Medicine.—Prof. of Hygiene. £E.1500.
Essex, Administrative County of.—Asst. M.O.H. £500.
Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.
Gloucester, Gloucestershire Royal Infirmary, &c.—H.P. and 2nd H.S. At rate of £135 and £100 respectively.
Golden-square Throat, Nose and Ear Hospital, W.—H.S. £100.
Halifax Royal Infirmary.—Third H.S. At rate of £125.
Harrogate Infirmary.—Jun. H.S.
Hertford County.—Asst. M.O.H. for Maternity and Child Welfare Services. £600.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. At rate of £50.
Hospital for Sick Children, Great Ormond-street, W.C.—Part-time Jun. Cas. O. At rate of £150. Also Med. Reg. and Pathologist. £300.
Huddersfield Royal Infirmary.—Surg. at rate of £150.
Hull Royal Infirmary.—3rd H.S. At rate of £150.
Huntingdon County Hospital.—H.S. £125.
Ilford Borough.—Asst. M.O.H. £600.
Indian Medical Service.—Commissions.
Infants Hospital, Vincent-square, Westminster, S.W.—Anæsthetist.
Jewish Maternity Hospital, Underwood-street, E.—Clin. Assts. Each 3 gns. for three months.
Kensington Tuberculosis Dispensary, 119, Ladbroke-grove, W.—Temporary Tuberculosis Officer. 35 gns. a month.
Lambeth Hospital, Brook-street, Renfrew-road, S.E.—Jun. Asst. M.O. £200.
Leeds General Infirmary.—Res. Aural O. £150. Ophth. and Aural H.S. At rate of £50. Asst. Receiving Room O. At rate of £60. Also Orthopædic H.S.
Leeds Public Dispensary.—Jun. Res. M.O. £150.
Leicester Royal Infirmary.—H.S. At rate of £125.
Lewisham Hospital, Lewisham, S.E.—Asst. M.O. £300.
Liverpool and District Hospital for Diseases of Heart.—H.P. At rate of £52.
London University.—External Examinerships.
Manchester, City of, Education Committee.—Asst. School M.O. £600.
Manchester Royal Infirmary.—H.P. and H.S. for Out-patient Department. Each £200.
Manitoba University.—Asst. Professor of Anatomy. 3500 dollars.
Middlesex County Council.—Asst. M.O. £600.
Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Asst. Cas. O. At rate of £100.
Miller General Hospital, Greenwich-road, S.E.—Cas. O. £150.
Ministry of Health, Government Lymph Establishment, Hendon.—Bacteriologist. £700 and bonus.
Newark General Hospital.—Res. H.S. At rate of £150.
Newcastle-upon-Tyne, City Hospital for Infectious Diseases.—Res. Med. Asst. £350.
Newcastle-upon-Tyne, Hospital for Sick Children.—Hon. Surgeon.
New End Hospital, Hampstead, N.W.—Jun. Asst. M.O. £200.
Norwich, Norfolk and Norwich Hospital.—H.S. £120.
Northwood, Mount Vernon Hospital.—Gynæcologist.
Plymouth City Hospital.—Med. Supt. £1000.
Poplar Hospital for Accidents, East India Dock-road, Poplar, E.—Second Res. O. At rate of £175.
Preston, Biddulph Grange Orthopædic Hospital.—Radiographer. £200. Also Jun. H.S. At rate of £150.
Prince of Wales's General Hospital, Tottenham, N.—Clin. Asst.
Queen's Hospital for Children, Hackney-road, E.—Clin. Asst. for Orthopædic Dept. 5*s.* each attendance.
Queen Mary's Hospital for the East End, Stratford, E.—H.P. and Cas. O. £150.
Rhondda U.D.C.—Asst. M.O.H. and Asst. School M.O. £500.
Richmond, Surrey, Royal Hospital.—Jun. H.S. At rate of £100.
Royal Chest Hospital, City-road, E.C.—H.P. At rate of £100.

Royal Free Hospital, Gray's Inn-road, W.C.—Res. Cas. O. £150. Also Res. Anæsthetist to Gyn. and Obstet. Unit. At rate of £150.
Royal Northern Hospital, Holloway, N.—Obstetric H.S. Res. Out-patient Cas. O. and Anæsthetist. Also H.S. All at rate of £70.
St. Bartholomew's Hospital, E.C.—Surgeon to Throat Dept. Also Asst. Physician.
St. Mark's Hospital for Cancer, &c., City-road, E.C.—H.S. At rate of £75.
St. Marylebone Hospital, St. Charles-square, Ladbroke-grove, W.—2nd Asst. M.O. £300.
Salford Royal Hospital.—H.P. and Cas. H.S. Each at rate of £125.
Salisbury, General Infirmary.—Two H.S.'s and H.P. Each £150.
Sheffield, Jessop Hospital for Women.—3 Asst. H.S.'s. Each at rate of £100.
Sheffield Royal Hospital.—Res. Anæsthetist. At rate of £80.
Sheffield Royal Infirmary.—H.S., Ophth. H.S., also Asst. Aural and Ophth. H.S. All at rate of £80.
Shrewsbury, Royal Salop Infirmary.—Res. Surg. O. £200.
Southampton Free Eye Hospital.—H.S. £150.
South-Eastern Hospital for Children, Sydenham, S.E.—Two Res. M.O.'s. At rate of £100 and £75 respectively.
Stafford, County Bacteriological Laboratory.—Locum Tenens Bacteriologist. 12 gns. weekly.
Sunderland, Durham County and Sunderland Eye Infirmary.—Locum.
Swindon and North Wilts Victoria Hospital.—Res. M.O. At rate of £125.
Taunton and Somerset Hospital.—Jun. H.S. At rate of £100.
Truro, Royal Cornwall Infirmary.—H.S. £170.
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The Secretary of State gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act for Kilmarnock, Ayr. Applications should reach the Private Secretary, Home Office, Whitehall, London, not later than July 12th.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at St. Blazey (Cornwall).

Births, Marriages, and Deaths.

BIRTHS.

FULLER.—On June 18th, at a nursing home, London, the wife of Dr. Radburne Fuller, of Trelyn, Perranporth, Cornwall, of twin sons.

ROBINSON.—On June 20th, at Cumberland Mansions, W., the wife of R. H. O. Betham Robinson, F.R.C.S., of a daughter.

MARRIAGES.

CASELEY—SPENCE.—On June 21st, at St. Andrew's Cathedral, Singapore, John Reginald Caseley, A.M.I.C.E., to Katherine Carruthers Spence, M.D.

MADILL—PANCKRIDGE.—On June 12th, at St. Peter's Church, Petersfield, Surgeon Lieut.-Commander T. Madill, Royal Navy, to Mary, daughter of Dr. and Mrs. Panckridge, Petersfield, Hants.

DEATHS.

BEATTY.—On June 19th, at Bessborough-road, Harrow-on-the Hill, Joseph Bensley Higginson Beatty, M.R.C.S.E., L.R.C.P.E., aged 69 years.

CARGILL.—On June 12th, at Kumasi, Gold Coast Colony, as the result of an accident, Winifred Drummond Cargill, M.B., Ch.B., D.T.M. & H.

KEMP.—On June 15th, James Kemp, M.B., Brook House, Carbrook, Sheffield, aged 59 years.

ROST.—On June 23rd, at West-hill, Putney, S.W., Lieut.-Col. Ernest R. Rost, O.B.E., K.I.H., M.R.C.S., L.R.C.P., Indian Medical Service (retired).

VICKERY.—On June 18th, at his residence, Ballywilliam, Kinsale, Co. Cork, George Vickery, M.D., M.Ch., in his 86th year.

WEBB-JOHNSON.—On June 23rd, after a short illness, at Upper Wimpole-street, W., Dr. Cecil Webb-Johnson, aged 51.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

Notes, Comments, and Abstracts.

AN ACTION FOR MALPRAXIS IN 1805.

BY L. A. PARRY, M.D., F.R.C.S.,
CONSULTING SURGEON TO THE ROYAL ALEXANDRA HOSPITAL FOR SICK CHILDREN, BRIGHTON.

THIS old case which I am going to describe has several points of interest, and it may be useful to discuss these and compare the proceedings with present-day practice.

Briefly the facts were as follows. An action was brought by the plaintiff, Seare, a shoemaker, against the defendant, Prentice, whom he employed as a surgeon, for negligently, ignorantly, and unskilfully reducing a dislocated elbow and fractured arm of the plaintiff, the cure of whose injury he had undertaken. The case was tried before Mr. Justice Heath at the Hertfordshire assizes. The brother-in-law of the plaintiff proved that on April 2nd, 1805, the defendant attended the plaintiff, who had fallen from a horse. Seare said he believed that his arm was broken. The defendant said he thought the arm, which was swollen, was not broken, and applied vinegar to it and bound it with tape. The plaintiff was under the care of Mr. Prentice for ten weeks without a cure being effected. He could not bend his arm or work at his trade. Then he applied to Mr. Kingston, another surgeon, and after some time could work and put his arm to his head. On cross-examination, witness said that the defendant was first sent for at night and came at once. He regularly attended Seare every day but one, till Mr. Piddock, a surgeon, was called in. He assisted Mr. Prentice in setting the elbow.

Unskilfulness without Negligence.

Mr. Kingston, the surgeon to whom Seare went later, gave evidence that in July the plaintiff was brought to him with a crippled arm, one bone of which was broken obliquely below the elbow. He was unable to turn his wrist, and had no movement at the elbow-joint. Witness broke the callus and set it again, and made what he himself described a very fine cure which was spoken of about the country. He attributed the failure of Mr. Prentice to negligence and carelessness. He said that an apprentice boy should have known better. The bone might have been set within five hours of the accident (why did he select this particular period of time?). He admitted that the swelling, if much, must first be reduced, and this might take two weeks. He advised the plaintiff to bring an action. He also spoke of a conversation he had had with Mr. Prentice, who said it was a very difficult dislocation to reduce, and that he would make a compensation to Seare.

The learned judge told the jury that the gist of the action was negligence, of which direct evidence might be given, or it might be inferred by the jury if the defendant had acted without any regard to the ordinary rules of his profession. Unskilfulness alone, without negligence, would not maintain the action. He was at a loss to tell the jury what degree of skill ought to be required of a village surgeon. Whether or not his direction were accurate in this report, at any rate the witness Kingston imputed only negligence and carelessness to the defendant in not discovering the fracture of the bone of the arm when they reduced the dislocated elbow. This was no doubt properly reduced, and considering all the circumstances of the case, he did not think that such gross negligence was imputable to the defendant as to make him liable for damages to the plaintiff. The jury gave a verdict for the defendant.

Retrial Refused.

A new trial was moved for on the ground that there was evidence before the jury of the *unskilful* treatment of the plaintiff by the defendant, but that they were told by the learned judge that unless negligence were proved they could not examine into want of skill. Mr. Gurney, plaintiff's counsel, acknowledged that the evidence did not substantiate the charge of negligence, but it did prove the want of skill. He referred to Slater *v.* Baker (2 Wils. 359) to show that an action lay against a surgeon for ignorance and unskilfulness in his profession, and to Bull N.P. 73, where the general rule is laid down that in all cases where a damage accrues to another person by the negligence, ignorance or misbehaviour of a person in the duty of his trade or calling, an action in the case will lie.

Lord Ellenborough, in giving judgment, said the surgeon who was specially examined, Mr. Kingston, imputed the failure of the treatment to negligence and carelessness, whatever other expression he may have used in the manner of giving his evidence, upon which the learned judge had

commented. Therefore, however, they might differ from him, as he certainly did, in thinking that an ordinary degree of skill is necessary for a surgeon who undertakes to perform surgical operations, and although he thought that a surgeon would be liable for *crassa ignorantia* and would be justly responsible for damages for having rashly adventured upon the exercise of a profession without the ordinary qualification of skill to the injury of the patient, yet the question did not arise upon the evidence in this case, for no want of skill was imputed to the defendant, and therefore the opinion of the learned judge who tried the case in the first instance upon that point did not affect the merits of the verdict. The other judges concurred, and the new trial was not granted.

In this case Mr. Justice Heath held that unskilfulness without neglect would not maintain the action. He himself however seemed doubtful whether this rather remarkable opinion was sound. At the trial negligence and carelessness were alone imputed, but the evidence showed that the dislocation was properly reduced and there was no gross negligence proved. He advised the jury not to convict and this advice was followed. Lord Ellenborough disagreed with Mr. Justice Heath, but held that in this case want of skill had not been proved and therefore he would not grant a new trial. His colleagues on the bench concurred in this judgment. There can be no doubt, I think, that as regards the first point (that unskilfulness without neglect would not maintain an action), Lord Ellenborough was right and Mr. Justice Heath wrong.

HOLIDAYS FOR WORKING WOMEN.

To the Editor of THE LANCET.

SIR,—May we once more, through the columns of your paper, plead the cause of the working women of London, and thereby secure for some of them, at least, the chance of a fortnight's respite from the toil and dull monotony of their daily lives? We want more help to enable us to lighten the burden of the mother of a large family, whose work is never ended, and who hardly knows what recreation means, of the lonely woman who, dependent upon her own modest earnings for her livelihood, carries on patiently, year in, year out, the dull struggle for existence, haunted by the fear of one day losing even that small income. The Women's Holiday Fund is striving to give to as many as possible of these tired and overburdened women the happiness and rest which a holiday should always bring. Away from the noise and dinginess of the London streets, and freed for a time from the worries of their homes, they are given a glimpse of a larger life. Jarred nerves are soothed by the fresh country or sea air, and hope and cheerfulness come back, when health is restored by good food and rest. The constant recurrence of such phrases as "living just like a lady," "all your meals got ready for you," in the letters of the women who write to thank for happy holidays, shows how much it means to those who are always ministering to others to find all arrangements specially made for their comfort. The applicants contribute what they can, according to their circumstances. Some indeed, having once tasted the joy of a holiday, begin saving up for the next year directly they return home.

A sum of £2 will pay for a fortnight's holiday for one woman. Donations for this sum and smaller amounts will be most gratefully received by The Secretary, Women's Holiday Fund, 76, Denison House, Vauxhall Bridge-road, S.W.1.—We are, Sir, yours faithfully,

A. F. LONDON, J. SCOTT LIDGETT,
MANUEL J. BIDWELL, HELEN A. POWNALL,
Chairman of Executive
June 17th, 1930. Committee.

"UNE PLÉTHORE MÉDICALE."

ACCORDING to an article in our lively contemporary, the *Siècle Médical*, the medical profession in France is in danger from its very popularity. Prof. G. Carrière, of Lille, states that the total number of entrants to the medical schools this year is double what it was last year, and he fears that with a swollen entry list the quality of the instruction must deteriorate. It seems that there are not enough cadavers and microscopes to go round, and the attendance at out-patients is so heavy that most of the students only see a few patients from a considerable distance and hear little or nothing of the items of instruction that the master bestows on them. The senior physician finds it a physical impossibility to go his rounds followed by the multitude who should accompany him, 40 or 50 students, and sometimes more. A few of the senior students, Prof. Carrière writes, can see the patient, and sometimes perhaps percuss and auscultate him; the remainder converse in a low tone on matters unconnected with medicine. The result is that candidates may qualify without knowing how to do a venesection or write a prescription, for, incredible though it may sound, in France there are no rejections at the hand of the examiners. Everyone who wants to qualifies sooner or later. In 30 years, Prof. Carrière says, he has never known a student, no matter how ignorant, fail to secure the parchment which gives him power of life or death over his fellow-men. The aspirant who fails at his first attempt waits a few months and then comes before another and more lenient jury. The candidate who has failed is not required to repeat any courses of instruction; he is obliged neither to attend lectures in the university nor to keep posts; he lives—as Prof. Carrière puts it—the serene life of an annuitant, without the slightest scholastic obligation, and, if he has been signed up for the regulation number of posts (or even sometimes if he has not), he earns a little money by doing locums for sick or absent colleagues. In some other professions the situation is quite otherwise. Veterinary science is taught in schools, entrance to which is by competitive examination for a limited number of places, only candidates with University degrees being allowed to compete. Progress is checked by repeated severe examinations, and a failure two years running, if below a certain standard, means dismissal. Prof. Carrière reports the farewell remark of one of the teaching staff to a batch of students who were being expelled in this way: "This does not matter very much, does it? I shall see you all next year on the benches of the Faculty of Medicine!" The remedies for which Prof. Carrière vehemently appeals are the restriction of entries to a certain number every year, calculated on the requirements of the profession, along with an adequate entrance qualification and drastic tightening of the curriculum and examinations, the latter to be conducted by teachers from another medical school. The provincial examiner is afraid that severity will prejudice him in the future, that students when they are qualified will remember it against him and refuse to call him into consultation or send him patients. There is, of course, in France no statutory tribunal of medical education and ethics, but if a tithe of what Dr. Carrière relates is intended to be taken seriously, even the most intemperate critics of our General Medical Council may be given pause.

THE MEDICINE OF AVICENNA.

WE recently reviewed a treatise on the Canon of Avicenna by Dr. O. Cameron Gruner in which there was incorporated a translation of the first book. In that review we expressed the opinion that in the Islamic revolt from Christianity the line of progress of medicine was to be found throughout a

long period of the development of our science. We have received from Teheran an eloquent letter of protest, the authorship of which we have been unable to trace. The gist of the protest was to the effect that Islamic teaching was no revolt from Christianity but an imperfect imitation of Christianity. Here the arguments were not of medical interest, though their historical backing was explained. But a photograph was enclosed which appears to be an entry to a tomb, and in case any of our readers recognise the structure we should be glad to be informed about it.

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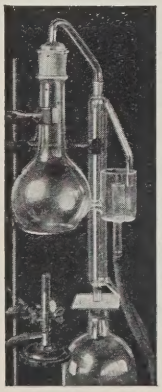

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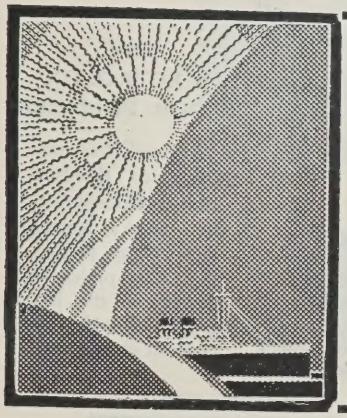

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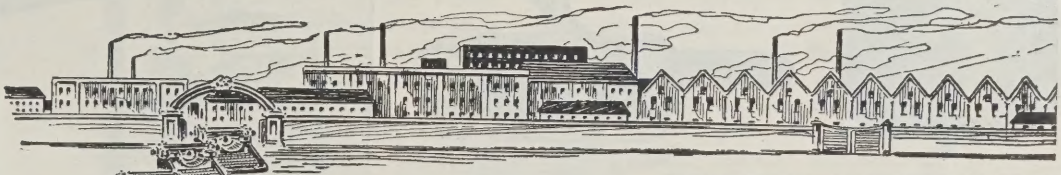

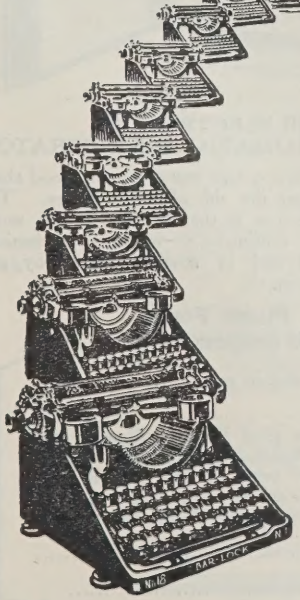

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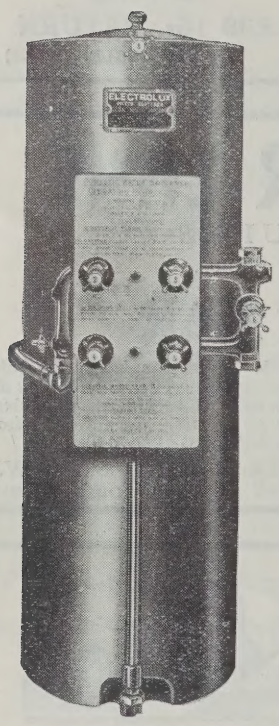

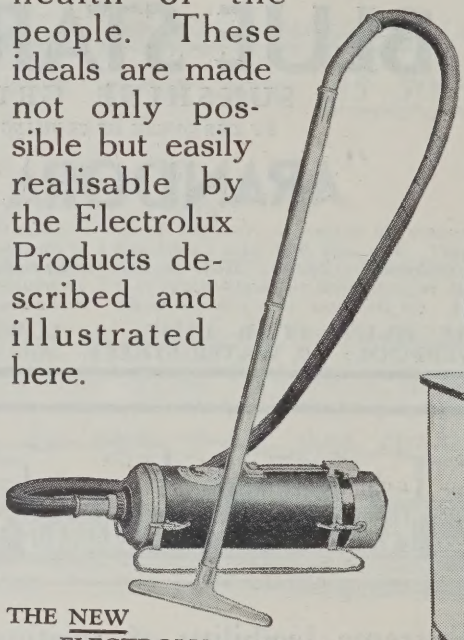

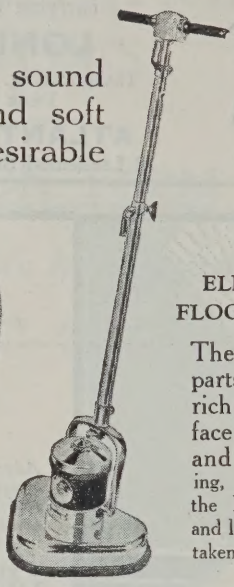

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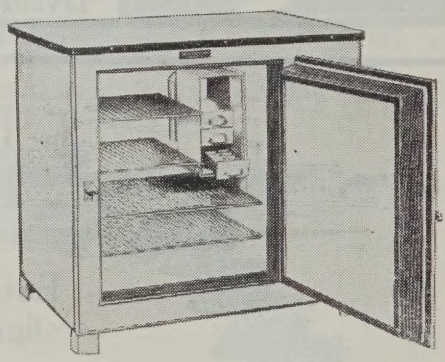

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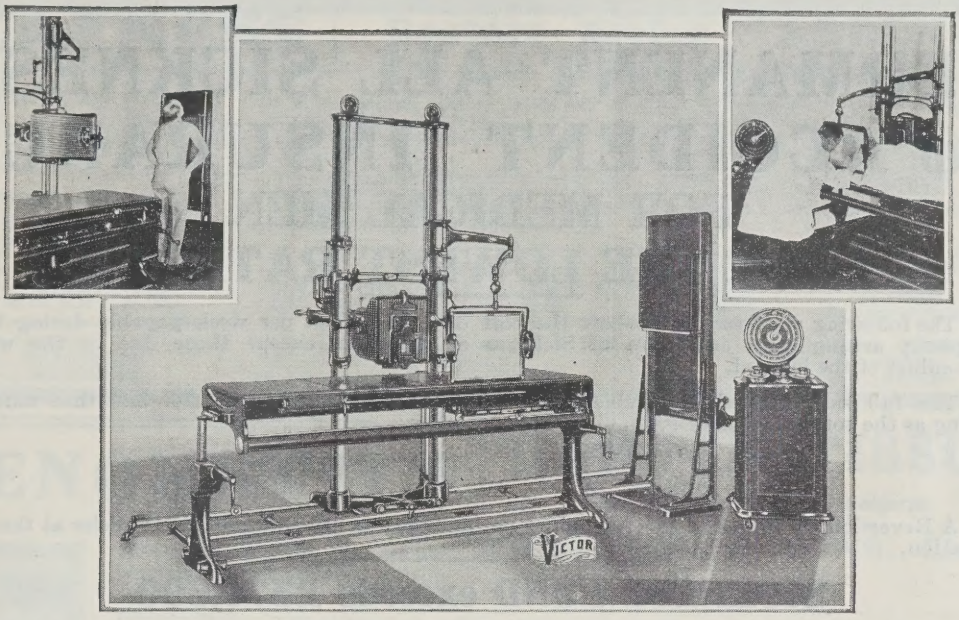

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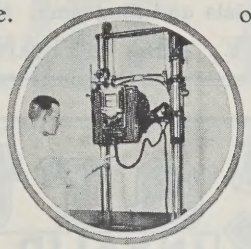

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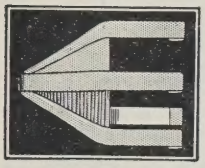

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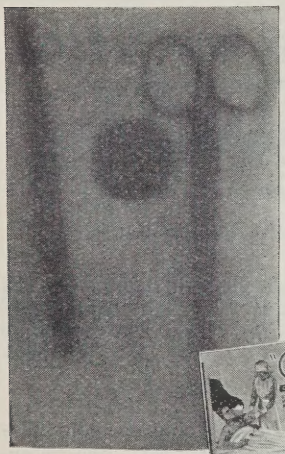

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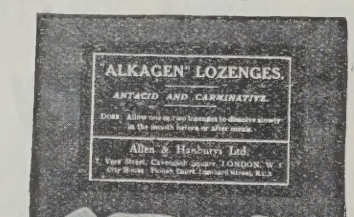

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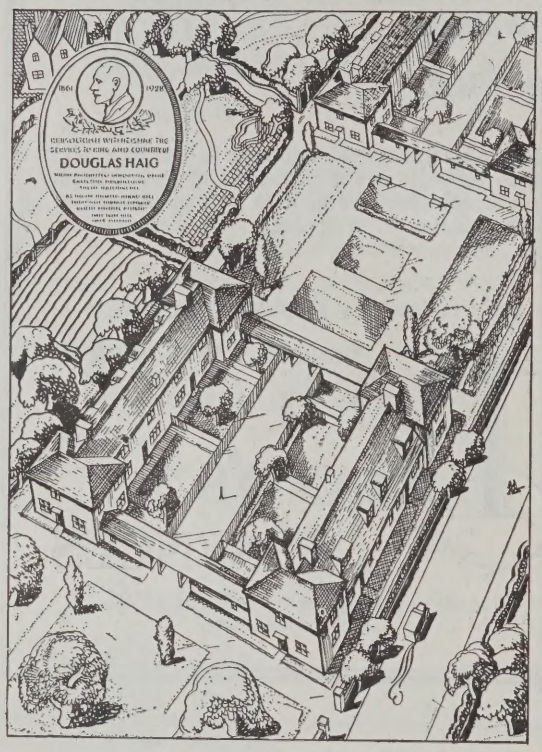

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MEDULLA RUBRA

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W. Borchardt (*Deut. med. Woch.*, March 28th, 1930, p. 521) records the results of his experiments on young dogs in which anæmia had been artificially produced by the removal of about half their blood. In the first series some of the animals were fed with rib-marrow, others with marrow from the long bones. Control animals received a corresponding amount either of fat or of liver extract. The basal diet in each case contained a sufficiency of iron (5 mg. per cent.). Only the animals receiving the red rib-marrow showed a definite increase of weight, and their hæmoglobin formation was more rapid than that of the others. In the next series the experiment was repeated, but the iron content of the diet was reduced to 1·4 mg. per cent. The result was similar but more striking, the dogs receiving the rib-marrow regaining their hæmoglobin far more quickly than the others.

THIS extract from the "Epitome of Literature," published in the "BRITISH MEDICAL JOURNAL" dated May 3rd last, is important as representing, in 1930, a complete justification of the formula upon which

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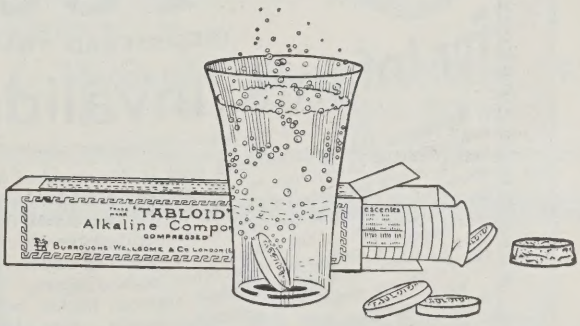

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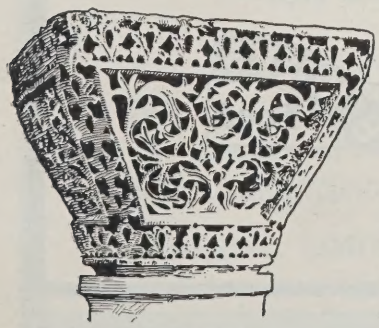

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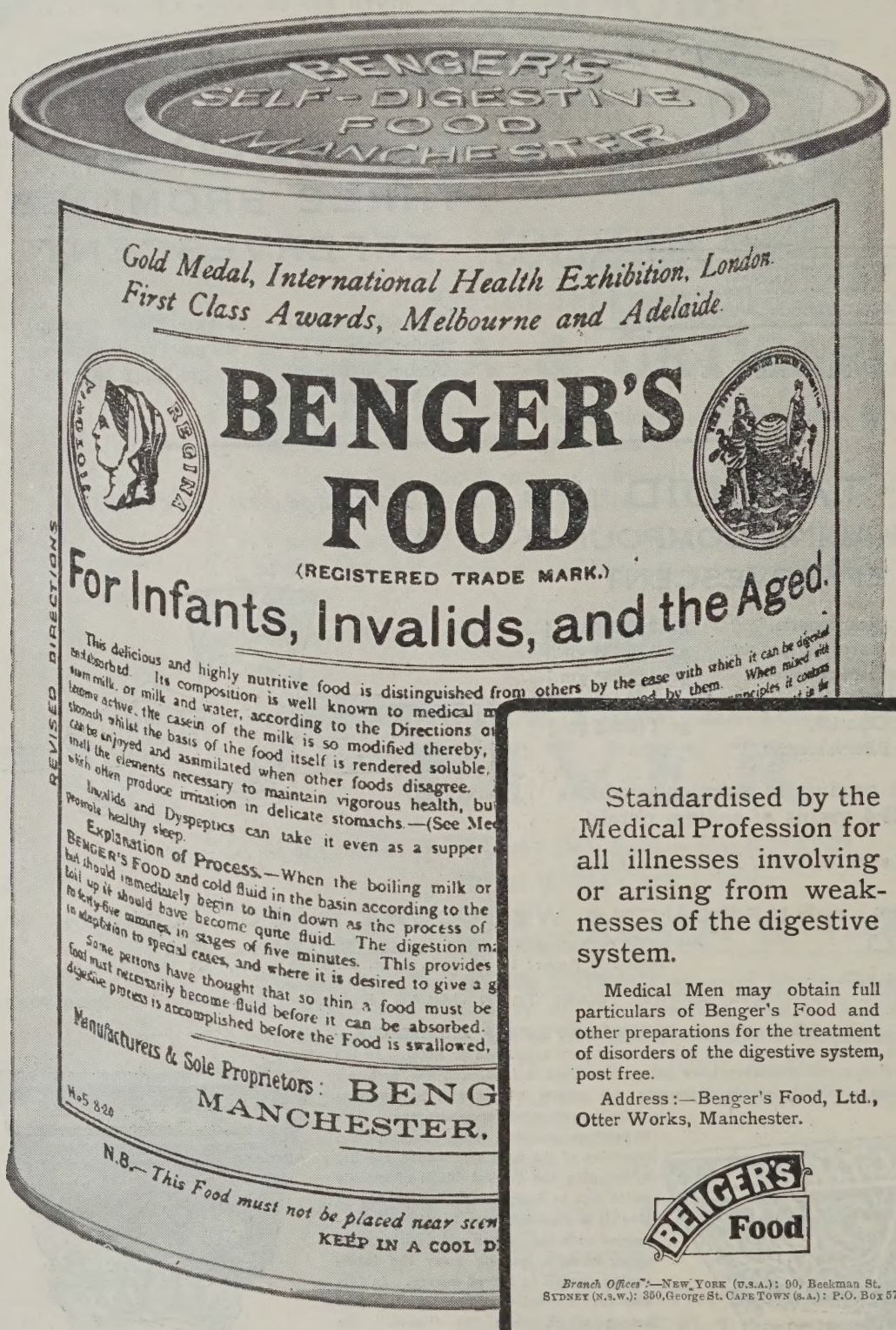

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M.143

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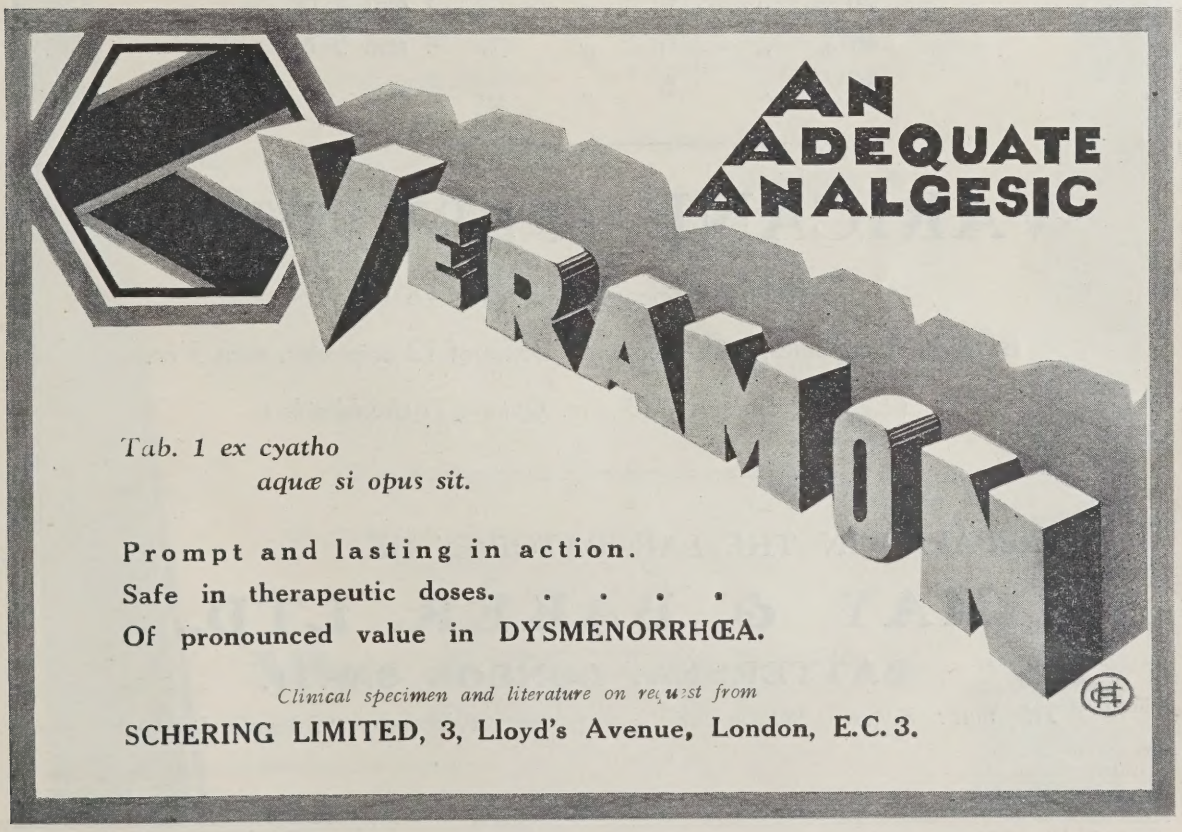

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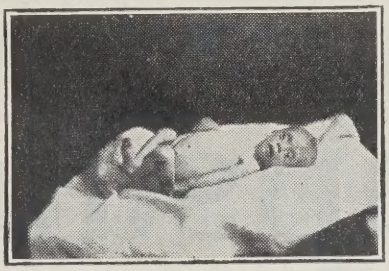
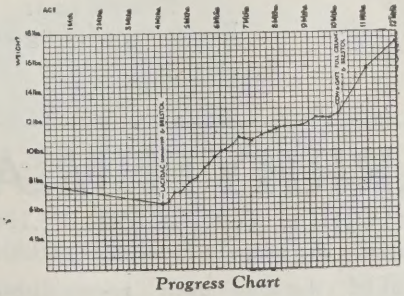


BEFORE 4 months' old—6 lbs. 9 ozs. in weight



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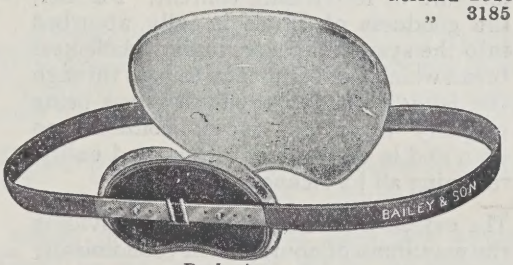

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Reliable and Experienced Nurses for all Cases at all Hours. Special Staff for Mental "Borderline," Neurasthenia, and Nerve Cases. All nurses are fully insured against accident.

Telephone: WELBECK 5640. Telegrams: "NURSINGDOM, LONDON."

Terms from £3-13-6d. per week.

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TRAINED MALE NURSES AND VALET ATTENDANTS for MENTAL MEDICAL, TRAVELLING AND ALL CASES

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Terms £4 4 0 per week.

ALL NURSES ARE FULLY INSURED AGAINST ACCIDENT.

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Please address all communications W. WALSHE, Secretary

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Specially Trained and Selected for all Cases, Male, Female, and Children.

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'Phone "WELBECK 6066."

G. GORDON, Supt.
'Grams: "ABSTAIN, LONDON."

ESTABLISHED AT THIS ADDRESS 1897.

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All Members of our Staff are Total Abstainers

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CERTIFICATED HOSPITAL NURSES (Male and Female) AVAILABLE DAY AND NIGHT FOR MEDICAL, SURGICAL, MENTAL, AND ALL CASES
TERMS from £3 3s. ALL NURSES ARE FULLY INSURED AGAINST ACCIDENT. Apply, LADY SUPERINTENDENT.

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60, WEYMOUTH STREET, PORTLAND PLACE, LONDON, W.1

Reliable and Experienced Nurses for all Cases at all Hours.
Special Staff for Mental "Borderline," Neurasthenia, and Nerve Cases.

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SUPERIOR CERTIFICATED MENTAL NURSES (MALE & FEMALE) SUPPLIED AT A MOMENT'S NOTICE, DAY OR NIGHT.

LADIES' TRAVELLING COMPANIONS. For all MENTAL and NERVE Cases. *All Nurses fully insured against Accident.*
Telegrams: "Isolation, London." Terms from £3 3 0 Apply SECRETARY. *Telephone:* Mayfair 2287

LITTLETON HALL, BRENTWOOD, ESSEX

(18 MILES FROM LONDON.)
400 feet above sea.
HOME for few LADIES Mentally Afflicted. Large grounds. Liverpool st. 26 min. Stations: Brentwood, Shenfield, one mile. Boarders Received. Apply Dr. Haynes. Telephone and Telegrams: Haynes Brentwood 45.

BARNWOOD HOUSE, GLOUCESTER.

A REGISTERED HOSPITAL FOR THE CARE AND TREATMENT OF LADIES AND GENTLEMEN SUFFERING FROM NERVOUS AND MENTAL DISORDERS.

Within two miles of the G.W. Railway and L.M. & S. Railway Stations at Gloucester, the Hospital is easily accessible by rail from London and all parts of the United Kingdom. It is beautifully situated at the foot of the Cotswold Hills, and stands in its own grounds of over 280 acres. Voluntary Boarders of Both Sexes are also received for treatment.

Special accommodation for Lady Voluntary Boarders is also provided at the MANOR HOUSE, which has its own private grounds and is entirely separate from the main Hospital.

For particulars as to terms, &c., apply to ARTHUR TOWNSEND, M.D., Resident Superintendent.
Telephone: No. 7 Barnwood.

CHEADLE ROYAL,

CHEADLE, CHESHIRE.

This Registered Hospital for Mental Diseases with its seaside branch Glan-y-don, Colwyn Bay, is for the treatment and care of PRIVATE PATIENTS of the UPPER and MIDDLE CLASSES. Voluntary Boarders received.

For terms, &c., apply to the Medical Superintendent, J. A. C. Roy, M.B., who may be seen in Manchester by appointment. Telephone: No. 481 GATLEY.

KILLEADEN HOUSE,

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Co. MAYO, IRELAND.

A PRIVATE HOME for the care and treatment of a limited number of NERVE AND EPILEPTIC PATIENTS. Family life with individual attention. Trained Nurse. Grounds 100 acres. Out-door life and recreations. Medical references England—Ireland.

For Terms apply Lady Superintendent.

SPRINGFIELD HOUSE

Phone: BEDFORD 3417.] **Near BEDFORD**

For Mental Cases with or without Certificates

Ordinary Terms Five Guineas per week (including Separate Bedrooms for all suitable cases without extra charge).

For forms of admission, &c., apply to the Drs. BOWER, as above, or at 15, Duchess-street, Portland-place, W.1, on Tuesdays from 4 to 5.

FEATHERSTONE HALL

SOUTHALL, MIDDLESEX.

A small PRIVATE HOME for the care and treatment of Ladies suffering from MENTAL DISORDERS. Voluntary Boarders received. Large Secluded Garden.
Apply to the Medical Superintendent. Tel.: Southall 0034.

PORTSMOUTH CITY MENTAL HOSPITAL.

Accommodation is provided for the reception of PRIVATE PATIENTS of both sexes in three detached Villas, which are healthily & pleasantly situated in extensive grounds with sea views.
Charges from 3 guineas weekly, including all necessaries except clothing.—Apply to the Medical Superintendent and Resident Physician, THOMAS BEATON, O.B.E., M.D., M.R.C.P.

CHISWICK HOUSE

A PRIVATE MENTAL HOSPITAL FOR THE TREATMENT AND CARE OF MENTAL AND NERVOUS DISORDERS.
Now removed to—
CHISWICK HOUSE, PINNER, MIDDLESEX.
Pinner 234.
A modern country house 12 miles from Marble Arch, in beautiful and secluded grounds.
Fees are from 10 guineas a week.
Voluntary Patients received for treatment.
DOUGLAS MACAULAY, M.D., D.P.M.

STRETTON HOUSE

Church Stretton, Shropshire.
A PRIVATE HOME for the treatment of gentlemen suffering from Mental and Nervous Illness, including the allied Disorders of Alcoholism and the Drug Habit. All types of early Mental and Nervous Cases are received without certificates as Voluntary Boarders. Bracing hill country. See "Medical Directory," p. 2219.—Apply to Medical Superintendent. 'Phone 10 P.O., Church Stretton.

NORTHUMBERLAND HOUSE,

GREEN LANES,
FINSBURY PARK, N.4.
A PRIVATE HOME for the treatment of patients of both sexes suffering from Mental Illnesses.
Private suites. Voluntary Boarders received without certificates.
For further particulars apply to the Medical Superintendent.
Tel.: North 0888. Telegrams: "SUBSIDIARY, LONDON."

BAILBROOK HOUSE,

BATH
A PRIVATE HOME for the Care and Treatment of persons with Mental and Nervous Disorders.
Voluntary Boarders received in the Villas. Large Mansion on outskirts of Bath, with 20 acres of grounds (see *Medical Directory, page* 2226).
For terms apply to SAMUEL J. GILFILLAN, O.B.E., M.B., C.M. Edin., Resident Physician.
Telephone No.: BATHEASTON 8189.

CLARENCE LODGE,

CLAPHAM PARK, LONDON.
Situated in 3½ acres of secluded gardens.
HOME FOR TWELVE MENTAL PATIENTS (LADIES).

Well-appointed private house. Home comforts and Trained Nursing Staff. Eminent Mental Specialist Visiting Physician.
A new feature in the Home is the Ultra Violet Ray Treatment.
Station: Clapham Common Tube.
'Phone: BRIXTON 0494.
Apply:
MRS. THWAITES.

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KINGSWINFORD, STAFFORDSHIRE.
An old-established home-like Institution for the treatment of MENTAL AFFECTIONS in BOTH SEXES. Probationary cases and non-certified patients are received as well as those regularly certified.
Full particulars as to reception terms, &c., may be obtained from the Resident Medical Officer.

YARROW HOME and HOSPITAL for CHILDREN,

BROADSTAIRS.
For the early and Preventive Treatment of Diseases and Convalescence after Illness.
The Hospital is intended for the Children of Members of the Institution of Civil Engineers, the Children of Architects, Artists, Authors, Clergymen, Members of the Medical, Legal and other Professions, Members of Scientific Societies, Officers of the Navy, Army and Royal Air Force, Officers of the Merchant Navy, Schoolmasters, and University Professors.
Accommodation is provided for 50 Boys between the ages of 4 and 12 years, and 50 Girls between the ages of 4 and 14 years. In special cases the age limits may be raised to 14 for Boys and 16 for Girls.
Fee 21/- per week
or as may be arranged, and travelling expenses.
Particulars can be obtained from the Secretary :—
116, Victoria Street, Westminster, LONDON, S.W.1

PRIVATE PATIENTS.

London County Council.—

Accommodation for Male Paying Patients is provided at the LONDON COUNTY MENTAL HOSPITAL, Claybury, Woodford Bridge, Essex.
The hospital is thoroughly equipped for modern treatment of certified cases.
Terms, exclusive of clothing and special luxuries, for patients having a legal settlement in the County of London, 44s. 11d. a week; for others, 48s. 5d. a week.
Full particulars from the Medical Superintendent, Claybury Mental Hospital, or from the Acting Chief Officer, Mental Hospitals Department, The County Hall, S.E.1.

MALLING PLACE, KENT

For LADIES and GENTLEMEN of Unsound Mind.
Terms Moderate: Apply to Resident Medical Superintendent.
Telegrams: ADAM WEST MALLING. Telephone: No. 2 MALLING.

THE WARNEFORD, OXFORD.

HOSPITAL FOR MENTAL DISORDERS.
President: The Right Hon. the EARL OF JERSEY.
This Registered Hospital, for the Treatment and Care, at moderate charges, of Mental Patients belonging to the educated classes, stands in a healthy and pleasant situation on Headington Hill, near Oxford. Voluntary Boarders are also received for treatment.—For further particulars apply to the Medical Superintendent.

THE COPPICE, NOTTINGHAM,

HOSPITAL FOR MENTAL DISEASES.
President: The Right Hon. the EARL MANVERS.
This Institution is exclusively for the reception of a limited number of PRIVATE PATIENTS of both sexes, of the UPPER and MIDDLE CLASSES, at moderate rates of payment. It is beautifully situated in its own grounds, on an eminence a short distance from Nottingham, and commands an extensive view of the surrounding country; and from its singularly healthy position and comfortable arrangements affords every facility for the relief and cure of those mentally afflicted. For terms, &c., apply to the Medical Superintendent.

ST. ANDREW'S HOSPITAL

FOR MENTAL DISORDERS,

NORTHAMPTON

FOR THE UPPER AND MIDDLE CLASSES ONLY.

PRESIDENT: THE MOST HON. THE MARQUESS OF EXETER, C.M.G., A.D.C.

MEDICAL SUPERINTENDENT: DANIEL F. RAMBAUT, M.A., M.D.

This Registered Hospital is situated in 120 acres of park and pleasure grounds. Voluntary Boarders, persons suffering from incipient nervous and mental disorders, as well as certified patients of both sexes, are received for treatment. Careful clinical, bio-chemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital, in detached grounds with a separate entrance, to which patients and voluntary boarders can be admitted. It is equipped with all the apparatus for the most modern treatment of Mental and Nervous Disorders. It contains special departments for hydrotherapy by various methods, including Turkish and Russian Baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombières treatment, &c. There is an operating Theatre, a Dental Surgery, an X-ray Room, an Ultra-violet Apparatus, and a Department for Diathermy and High Frequency treatment. It also contains Laboratories for bio-chemical, bacteriological, and pathological research.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit and vegetables are supplied to the Hospital from the farm, gardens and orchards of Moulton Park. Occupation therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The Seaside house of St. Andrew's Hospital is beautifully situated in a Park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North West side of the Estate a mile of sea coast forms the boundary. Voluntary Boarders or Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard court), croquet grounds, golf courses and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts such as carpentry, &c.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: No. 56 Northampton), who can be seen in London by appointment.

SHAFTESBURY HOUSE

FORMBY-BY-THE-SEA, Nr. LIVERPOOL.

Specially built and licensed for the care and treatment of a limited number of Ladies and Gentlemen suffering from NERVOUS or MENTAL breakdown. Voluntary boarders received. Psycho-Therapy in suitable cases if desired. Terms moderate. *Apply* RESIDENT PHYSICIAN. *Tel. No. 8 Formby.*

CAMBERWELL HOUSE,

Telegrams: "PSYCHOLIA, LONDON." 33, PECKHAM RD., LONDON, S.E.5. Telephone: Rodney 4731, 4732

For the Treatment of MENTAL DISORDERS.

Also completely detached Villas for Mild Cases, with private suites if desired. Voluntary Patients received. Twenty acres of grounds, Hard and Grass Tennis Courts, Bowls, Croquet, Squash Rackets, and all indoor amusements, including Wireless and other Concerts. Occupational Therapy, Physical Drill, and Dancing Classes. X-ray and Actino-therapy, Prolonged Immersion Baths, Operating Theatre, Dental Surgery, and Ophthalmic Department. Chapel.

Senior Physician: DR. HUBERT JAMES NORMAN, assisted by three Medical Officers, also resident, and Visiting Pathologist.

An Illustrated Prospectus may be obtained upon application to the Secretary.

HOVE VILLA, BRIGHTON.—Convalescent Branch of the above.

THE OLD MANOR SALISBURY

A Private Hospital for the Care and Treatment of those of both sexes suffering from MENTAL DISORDERS.

Extensive grounds. Detached Villas. Chapel. Garden and dairy produce from own farm. Terms very moderate.

CONVALESCENT HOME AT BOURNEMOUTH standing in 9 acres of ornamental grounds, with tennis courts, etc., which Patients or Boarders may visit, by arrangement for long or short periods.

Illustrated Brochure on application to the Medical Superintendent, The Old Manor, Salisbury. Telephone: 51.

HAYDOCK LODGE,

NEWTON-LE-WILLOWS, LANCASHIRE.

For the reception and treatment of PRIVATE PATIENTS of both sexes of the UPPER AND MIDDLE CLASSES either voluntarily or under Certificate. Patients are classified in separate buildings according to their mental condition.

Situated in park and grounds of 400 acres. Self-supported by its own farm and gardens in which patients are encouraged to occupy themselves. Every facility for indoor and outdoor recreation. For terms, prospectus, etc., apply MEDICAL SUPERINTENDENT. *Phone:* 11 Ashton-in-Makerfield.

PECKHAM HOUSE, 112, Peckham Road, London, S.E. 15

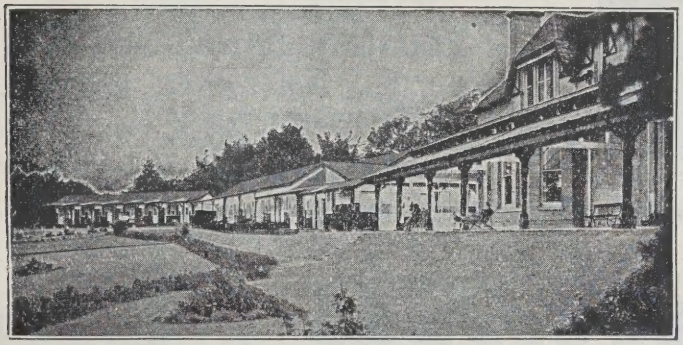
Telegrams: "Alleviated, London." **Telephone: Rodney 4741 and 4742.**

The above House, which was established in 1826, is an Institution for the care and treatment of persons suffering from mental diseases and nervous disorders. Both certified patients and Voluntary Boarders are received. Separate houses for treatment and accommodation of special cases adjoin the Institution. There is a seaside branch, Kearsney Court, near Dover, to which patients may be sent for treatment or on holiday. Motor and carriage exercise is provided as required. Patients can avail themselves of a course of physical drill. Tennis courts. Entertainments, dances and indoor amusements held throughout the year.
Illustrated prospectus and further particulars can be obtained from the MEDICAL SUPERINTENDENT.

VALE OF CLWYD SANATORIUM.

This Sanatorium is established for the treatment of Tuberculosis of the Lungs and the Pleural Cavities. It is situated in the midst of a large area of park-land at a height of 450 feet above sea level, on the South-West slopes of mountains rising to over 1800 feet, which protect it from north and east winds and provide many miles of graduated walks with magnificent views. Average rainfall 29·57 per annum. Full day and night Nursing Staffs. X Ray plant. Every facility for Artificial Pneumothorax and for operations on the chest. Electric Lighting. Central Heating. Home Farm. Grade A Milk from T.T. Herd.
For particulars apply to Medical Superintendent:
H. MORRISTON DAVIES, M.D., M.Ch. (Cantab.), F.R.C.S., Llanbedr Hall, Ruthin, N. Wales.

THE COTSWOLD SANATORIUM



Specially built in 1898 on the Cotswold Hills, seven miles from Cheltenham, for the treatment of Pulmonary and all other forms of Tuberculosis on Nordrach lines. Aspect S.S.W., sheltered from North and East, elevation 800 feet. Pure bracing air. SPECIAL TREATMENT by artificial PNEUMOTHORAX (X-Ray controlled), TUBERCULINS, and ULTRA-VIOLET RAYS is available when necessary without extra charge. X-RAY plant. Electric light. Radiators, hot and cold basins, and Wireless in all rooms.

Full day and night Nursing Staff.

Resident Physicians: ARTHUR H. HOFFMAN, M.D., and G. A. HOFFMAN, M.B.

Apply: The Secretary, The Cotswold Sanatorium Cranham, Gloucester.

Telephone: 41 *Witcombe.* *Telegrams:* "*Hoffman. Birdlip.*"

DARTMOOR SANATORIUM. 750 FEET ABOVE SEA-LEVEL

Established 1903 for Treatment of Pulmonary and other forms of Tuberculosis. Sheltered Situation on the slopes of the bracing Moorland. Radiographic Installation, Electric Light, Central Heating, Separate Bedrooms, Efficient Treatment combined with individual comfort and minimum restrictions. Illustrated Prospectus on request to the Resident Physician: C. H. BERRY, M.R.C.S., L.R.C.P., Dartmoor Sanatorium, Chagford, Devonshire. Telephone: 11 CHAGFORD.

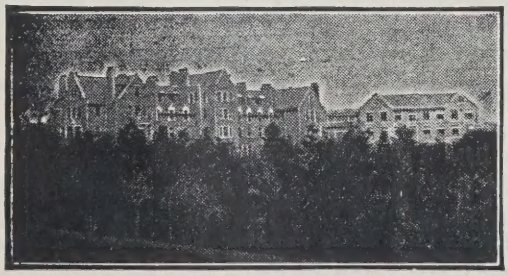
PRIOR PLACE SANATORIUM

HEATHERSIDE, CAMBERLEY.

RECENTLY OPENED FOR THE TREATMENT OF PULMONARY TUBERCULOSIS.
WELL SITUATED ON HIGH GROUND AND SURROUNDED BY PINES AND HEATHER.

RESIDENT MEDICAL SUPERINTENDENT: Dr. H. O. BLANFORD, late Medical Superintendent, King Edward VII. Sanatorium, Midhurst, to whom applications for particulars may be made.

TOR-NA-DEE SANATORIUM
MURTLE, DEESIDE, ABERDEENSHIRE



Medical Director: DAVID LAWSON, M.D., F.R.S.E.

FULLY EQUIPPED WITH *EVERY MODERN APPLIANCE* FOR THE DIAGNOSIS AND TREATMENT OF ALL FORMS OF TUBERCULOSIS & ALLIED DISEASES.

Physician Superintendent: J. M. JOHNSTON, M.B., D.P.H., etc.

Full particulars and Prospectus on application to the Secretary.

INCLUSIVE TERMS: SEVEN GUINEAS A WEE K

RUTHIN CASTLE

(Formerly Duff House, Banff).

The first Private Hospital in the United Kingdom to be fully provided with a whole-time specially qualified Staff of Doctors, Analytical Chemists, Bacteriologists, Radiologists, Nurses, Dietists, Masseurs, and Masseuses, and a full equipment of Laboratories, X-rays, Electrocardiograph, Artificial Sunlight, and Medical Baths.

The Hospital is equipped for the diagnosis and treatment of any form of ill-health, except Mental and Infectious Diseases. The fees are inclusive.

The climate is mild and the neighbourhood beautiful.

Apply: THE SECRETARY, Ruthin Castle, North Wales.

Telegrams: CASTLE RUTHIN. *Telephone:* 66 RUTHIN.

HOSPITAL FOR CONSUMPTION

AND DISEASES OF THE CHEST, BROMPTON,

and FRIMLEY SANATORIUM.

SPECIAL WARDS FOR PAYING PATIENTS.

3 to 4 guineas per week.

Apply to the Secretary, Brompton Hospital, S.W. 3.

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WIESBADEN

Germany's greatest Medical Baths. Notable performances in the Kurhaus and State Theatres. WORLD FAMOUS THERMAL SALT SPRINGS AT 150°. CURE: GOUT, RHEUMATISM, Nervous Disorders and Metabolism, Diseases of the Respiratory and Digestive Organs, Curative Diet. Station of Rhine Steamers at Wiesbaden-Biebrich.

Salts and pastilles for export

Good accommodation at moderate prices. Hotel lists (8000 beds) from the Municipal Information Office and Travel Bureaux.

PARK SANATORIUM

(FORMERLY SANATORIUM TURBAN)

DAVOS-PLATZ, SWITZERLAND.

First-class house, 5,150 ft. above sea-level. Large park and wood belonging to the sanatorium. Terms for board and residence, including room, medical treatment, etc., from £5 12s. per week. Prospectus.

Medical Superintendent, F. BAUER, M.D.

INEBRIETY.

Telephone: 16 Rickmansworth.

DALRYMPLE HOUSE, RICKMANSWORTH, HERTS.,

For the treatment of Gentlemen under the Act and privately. Established 1883 by an association of prominent medical men and others for the study of inebriety; profits, if any, are expended on the institution. Large secluded grounds on the banks of the river Colne. Full sized billiards, tennis, croquet, bowls. Golf (Moor Park and Sandy Lodge) close by.—Apply to F. S. D. Hogg, M.R.C.S., &c., Res. Med. Supt.

ALCOHOLISM, DRUG HABIT and NEURASTHENIA.

BAY MOUNT, PAIGNTON.

Ladies and Gentlemen treated in small Private Home
EXCELLENT RESULTS FROM MODERN TREATMENT.
SPLENDID CLIMATE. AMPLE AMUSEMENT.
MODERATE INCLUSIVE TERMS.
Prospectus, report, etc., from STANFORD PARK, M.B., Ch.B., Res. Med. Supt. *Phone: Paignton 5110.*

ALCOHOLISM, OTHER DRUG HABITS, and TROPICAL Ailments

THE HARE NURSING HOME

As founded and established by the late Dr. FRANCIS HARE, for 20 years Med. Supt. of The Norwood Sanatorium, and author of "Alcoholism," etc.; for the treatment of ALCOHOLISM, other Drug Habits, Insomnia, Neurasthenia, Functional Nervous Disorders, TROPICAL Ailments, etc.

"THE OLD HILL HOUSE," CHISLEHURST, KENT.

Terms Moderate. Quiet and pleasant situation.
Ladies and gentlemen admitted for treatment.
For prospectus, etc., write or phone, WALTER E. MASTERS, M.D., M R C.S., D.P.H., Barrister-at-law (Res. Med. Supt.).
Phone: Chislehurst 451. Telegrams: "Masters," Chislehurst

FUNCTIONAL NERVOUS DISORDERS ALCOHOLISM and DRUG ADDICTION

at CALDECOTE HALL, NUNEATON.

This Mansion has been opened upon the most modern and scientific lines both physical and mental.
Resident Medical Superintendent—
A. E. CARVER, M.A., M.D., M.R.C.S., D.P.H., D.P.M.
Full particulars upon request.
Prospectus from the SECRETARY 40, Marsham Street, Westminster, S.W.

SMEDLEY'S HYDRO.

MATLOCK. Established 1853.

Physicians: G. C. R. Harbinson, M.B., B.Ch.
R. MacLelland, M.D., C.M. (Edin.).
Prospectus and full information on application to the Manager.

PEEBLES HYDRO.

Beautifully situated 600 feet above sea level. Facing South, completely sheltered from North and East.
21 miles from Edinburgh.
All modern Baths, Douches, Massage and Electrical Treatment. Ultra-violet-Radiation. Physician in attendance.
IDEAL HEALTH RESORT.
Electric Light, Central Heating, Electric Lift, Three Billiard Tables, Ball Room, Winter Garden, Swimming Bath, Hard and Grass Tennis Courts, Badminton, Croquet Lawn, Golf Course.
Prospectus from Manager. 'Phone: Peebles 2.

Telegraphic Address: "Relief, Old Catton." Telephone: 290 Norwich.

NERVOUS & MENTAL AFFECTIONS.

Ladies only received.

The Grove, Old Catton, Norwich.—A High-class Home for the Curative Treatment of Nervous Affections. Voluntary Boarders are also received without certificates.

For full particulars apply to the Misses McLINTOCK, or to Dr. S. BARTON, 34, Surrey-street, Norwich, Visiting Physician.

Grove House, All Stretton, Church STRETTON, SHROPSHIRE.

A PRIVATE HOME for the care and treatment of a limited number of Ladies Mentally Afflicted.
Climate healthy and bracing.
Apply to Dr. McClintock, Proprietor and Resident Medical Superintendent.

Service Suite, furnished, 3 bed.,

1 sitting, 1 bathroom. Suit Students. Meals by arrangement. General dining-room. £3 weekly. Gas, electric.—4, Leinster gardens, Lancaster Gate, W.2. Padd. 7241

GERMANY. **Sanatorium** **Würtemberg, Black Forest.**

Clinically conducted institutions for the treatment of Nervous Affections.
Open all the Year round.
Prospectuses on application.

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Special scientifically established successful treatment of the conditions resultant on encephalitis lethargica, Parkinsonism.
Dr. C. ROMER, Councillor of Health.

Central London Ophthalmic Hospital,

Judd-street, St. Pancras, W.C.1.

There are vacancies for the posts of SENIOR and JUNIOR HOUSE SURGEON. Salaries at the rate of £120 and £100 per annum respectively, with board and residence in the Hospital.
Applications, with testimonials, from duly qualified candidates, must be sent to the undersigned on or before July 5th.
H. R. S. DRUCE, Secretary.

Central London Ophthalmic Hospital,

Judd-street, W.C.1.—There is a vacancy for an OUT-PATIENT OFFICER to the Hospital, who shall attend on four afternoons a week. Remuneration at the rate of £200 per annum. Applications, with testimonials showing ophthalmic experience, to be submitted not later than Saturday, July 5th. Details in regard to the posts may be obtained from the Secretary, H. R. S. DRUCE.

St. Bartholomew's Hospital, E.C.1.

OFFICE OF SURGEON TO THE THROAT DEPARTMENT.

Notice is hereby given that a Meeting of the Election Committee will be held on Tuesday, 22nd July, 1930, at 4 o'clock in the afternoon, to elect a Surgeon to the Throat Department of this Hospital.
Candidates are required to lodge fifty copies of their applications and testimonials with the undersigned (from whom particulars as to qualifications for the office can be obtained) on or before Friday, 4th July, 1930. THOMAS HAYES,
13th June, 1930. Clerk to the Governors.

St. Bartholomew's Hospital, E.C.1.

OFFICE OF ASSISTANT PHYSICIAN.

Notice is hereby given that a Meeting of the Election Committee will be held on Tuesday, 22nd July, 1930, at 4 o'clock in the afternoon, to elect an Assistant Physician to this Hospital.
Candidates, who must be Fellows or Members of the Royal College of Physicians of London, are required to lodge fifty copies of their applications and testimonials with the undersigned on or before Friday, 4th July, 1930.
THOMAS HAYES,
13th June, 1930. Clerk to the Governors.

The Willesden General Hospital

(Incorporated), N.W.10. (106 Beds.)

Applications are invited for the appointment of RESIDENT HOUSE SURGEON. Candidates must be duly registered under the Medical Acts and unmarried.
Salary at the rate of £110 per annum. Detailed applications, with copies of testimonials, to be sent to the Secretary by Thursday, 3rd July, 1930.
14th June, 1930. R. J. HEARNE, Secretary.

St. Mark's Hospital for Cancer,

FISTULA, and OTHER DISEASES of the RECTUM, City-road, London, E.C.1.

HOUSE SURGEON (Male) required, must be fully qualified. Salary £75 per annum, with board, residence, and laundry. The appointment is for a minimum of six months. Applications, with copies of testimonials, to be sent to the Secretary (from whom further particulars may be obtained) by Friday, the 4th of July, 1930.

The Hospital for Sick Children,

Great Ormond-street, London, W.C. 1.

A PART-TIME JUNIOR CASUALTY OFFICER is required on the 9th July, 1930, to assist in the Casualty Department, from 10 A.M. to 3 P.M. (Saturdays 10 A.M. to 1 P.M.), under the direction of the Casualty Officer.

The work of this Officer includes a large number of Tonsillectomies and other minor operations.

Candidates must be registered Medical Practitioners and have held a responsible Hospital appointment.

Gentlemen are invited to send in their applications, addressed to the Secretary, before 12 o'clock on Monday, 30th June, 1930, accompanied by copies of not more than three testimonials written specially for the purpose.

The appointment is made for six months, and is non-resident. Salary at the rate of £150 per annum, with luncheon.

All candidates must be in attendance to appear before the Joint Committee, if required, at their meeting on Wednesday, 2nd July, 1930, at 4.45 P.M. precisely.

Forms of application and copies of the Rules may be obtained from the Secretary at the Hospital.

By order of the Board of Management.

June, 1930. JAMES MCKAY, Secretary.

University of London.

EXTERNAL EXAMINERSHIPS, 1931.

The Senate announce the following vacant External Examinerships for all Examinations above Matriculation for the year 1931. Except when otherwise stated, Examiners will act in all Examinations in which the subject is included.

For the First Examination for Medical Degrees.
CHEMISTRY.

For the Second Examination for Medical Degrees.
PHARMACOLOGY.

For Final and Higher Examinations for Medical Degrees.
MEDICINE. SURGERY,
and OBSTETRIC MEDICINE.

ASSOCIATE EXAMINERS.

Applications will also be invited for Associate Examiners in Medicine, Obstetric Medicine, Pathology, and Surgery. A separate application form must be used for Associate Examinerships and the word "Associate" must be written on it.

Application form (or forms if more than one Examinership is applied for) and particulars of the remuneration and duties can be obtained from the External Registrar.

Candidates must send in their names to the External Registrar, Geo. F. Goodchild, M.A., B.Sc., with any attestation of their qualifications they may think desirable, on or before Monday, 7th July, 1930. (Envelopes should be marked "Examinership.")

The Senate desire that no application of any kind be made to individual members.

If testimonials are submitted, one copy only of each is required. In no case should original testimonials be submitted. If more than one Examinership is applied for, a separate and complete application must be forwarded in respect of each Examinership. The appointments will be made by the Senate in November. Applicants who desire that the result should be communicated to them are requested to enclose a stamped and addressed envelope with their applications. EDWIN DELLER, Principal.

University of London, South Kensington, S.W.7.

June, 1930.

Borough of Ilford.

APPOINTMENT OF ASSISTANT MEDICAL OFFICER OF HEALTH.

The Corporation invites applications from legally qualified medical persons of both sexes for the office of Assistant Medical Officer of Health, for duties in connexion with Maternity and Child Welfare Work, School Medical Inspection, and General Public Health Work. Candidates for the appointment must have had special experience in Midwifery since qualification, and, subject to this, preference will be given to Candidates who possess the Diploma of Public Health or similar qualification, and have had definite experience in children's diseases.

The commencing salary of the Officer will be £600 per annum (no bonus), rising by one annual increment of £50 and two annual increments of £25 to £700 per annum, subject to satisfactory service.

The person appointed will be required to devote whole time to the duties of the office, to reside within easy distance of the Corporation's Maternity Home, and to enter into an agreement for the due performance and fulfilment of all the duties and conditions governing the appointment. The appointment will be subject to a satisfactory medical examination and to the provisions of the Local Government and Other Officers' Superannuation Act, 1922.

Applications, which must be made on forms obtainable (with list of duties) from the undersigned, accompanied by copies of three recent testimonials (which will not be returned), endorsed "Assistant Medical Officer of Health," must be received at my office, at the Town Hall, Ilford, not later than Tuesday, the 1st day of July, 1930.

Canvassing Members of the Council, directly or indirectly, is prohibited and will disqualify.

By order.

ADAM PARTINGTON, Town Clerk.

Town Hall, Ilford, 17th June, 1930.

Administrative County of London.

HOSPITALS SERVICE.

The London County Council invites applications from fully qualified medical practitioners for appointment to positions at the undermentioned hospitals. Candidates must have had previous residential hospital experience. Residential accommodation is available only for the person appointed. The persons appointed will be required to carry out such duties as may be assigned by the medical superintendents, and should occasion arise, to assist at any of the other establishments or medical districts under the control of the London County Council.

(a) COLINDALE HOSPITAL, Hendon, N.W.9 (advanced cases of pulmonary tuberculosis). SENIOR ASSISTANT MEDICAL OFFICER. Commencing salary £650 a year. Candidates must have had previous experience at a hospital for pulmonary tuberculosis.

(b) LAMBETH HOSPITAL, Brook-street, Renfrew-road, S.E.11. JUNIOR ASSISTANT MEDICAL OFFICER. Salary £200 a year with, if non-resident, an allowance of £125 a year in lieu of lodging and laundry, together with meals when on duty, these being valued for superannuation purposes at £25 a year.

(c) LEWISHAM HOSPITAL, Lewisham, S.E.13. ASSISTANT MEDICAL OFFICER, special experience in midwifery desirable. Salary £300 a year, with board, lodging, and laundry.

(d) NEW END HOSPITAL, Hampstead, N.W.3. JUNIOR ASSISTANT MEDICAL OFFICER. Salary £200 a year, with board, lodging, and laundry.

(e) ST. MARYLEBONE HOSPITAL, St. Charles'-square, Ladbroke-grove, W.10. SECOND ASSISTANT MEDICAL OFFICER. Commencing salary £300 a year, with board, lodging, and laundry.

(f) BETHNAL GREEN HOSPITAL, Cambridge-road, E.2; ASSISTANT MEDICAL OFFICER. £400 a year, with board, lodging, and laundry.

The salaries and conditions of employment in each case are provisional, and are subject to review by the Council.

In the case of women, marriage terminates contract of service.

Forms of application may be obtained from the Medical Officer of Health (Staff Division), The County Hall, Westminster Bridge, S.E.1. A stamped addressed foolscap envelope should be enclosed and forms must be returned by 3rd July, 1930. Canvassing disqualifies.

Candidates desiring to apply for more than one appointment must send in a separate form of application in respect of each hospital. Inquiries for further details as to the nature and scope of the duties at the individual hospitals should be addressed to the medical superintendent of the hospital concerned.

MONTAGU H. COX, Clerk of the London County Council.

19th June, 1930.

Royal Free Hospital, Gray's Inn-road, W.C.1.

—Applications are invited for the post of RESIDENT CASUALTY OFFICER (Male). Salary £150 per annum. Candidates must be duly qualified registered Medical Practitioners, and must submit applications, stating age, and accompanied by copies of three recent testimonials, to the undersigned on or before 12th July, 1930.

REGINALD R. GARRATT, Secretary.

West London Hospital, Hammersmith, W.6.

Applications are invited for the post of CLINICAL ASSISTANT (Two vacancies) in the Children's Medical Out-patient Department, from registered Medical Practitioners, Male or Female, unpaid. Attendance on Wednesday and Saturday mornings. H. A. MADGE, Secretary.

West London Hospital, Hammersmith, W. 6. (234 Beds.)

Applications are invited for the post of RESIDENT ASSISTANT PHYSICIAN at the above Hospital, duties to commence at once. Candidates must be unmarried and duly registered Medical Practitioners and must have held the post of House Physician at a General Hospital.

Preference will be given to candidates who hold the Diploma of M.R.C.P. As Senior Resident Officer he will be responsible for certain administrative duties, and later those of Medical Registrar and such duties in connexion with the Post-Graduate College as the Board may approve.

The appointment is for one year, but the holder shall be eligible for re-election annually up to a maximum period of three years. Salary at the rate of £300 per annum (plus £25 p.a. for services in connexion with the Venereal Diseases Department), with board and residence. The appointment may be terminated by one month's notice on either side.

Candidates are required to send to me seven copies of their application and testimonials, also to send a copy to, and to call upon, each member of the Medical Council. Applications must reach me not later than first post on 11th July. Candidates must attend a Meeting of the Medical Council at 4.30 P.M. on Friday, 18th July. Selected candidates will be required to attend the Board of Management at 5 P.M. on Tuesday, 22nd July, when the appointment will be made.

H. A. MADGE, Secretary.

ROYAL ARMY MEDICAL CORPS

25 PERMANENT COMMISSIONS in the ROYAL ARMY MEDICAL CORPS will be offered in July, 1930. Applications should reach the War Office not later than the 20th July.

Candidates will be selected for Commissions without competitive examination, and will be required to present themselves in London for interview and medical examination towards the end of July. They must be under twenty-eight years of age on 1st August, 1930, and registered under the Medical Acts.

Officers of the Royal Army Medical Corps are liable to serve in any part of the world where British Troops are quartered.

Ample opportunities exist in the Army for clinical professional work, both Medical and Surgical, as well as for the study and practice of Hygiene, Pathology, and all the special branches.

The cost of Post-graduate study, which is compulsory, is met from Army Funds.

PAY AND ALLOWANCES.—From £500 to £2,000 a year, according to rank and length of service.

Gratuities on retirement.—After 7 years' service £1,000
„ 15 „ „ £2,800
„ 18 „ „ £3,500

Current rates of retired pay range from £368 10s. per annum, normally earned by a Major after 20 years' service, to £930 per annum, the maximum for which a Major-General is eligible. The rates of pay and retired pay are subject to periodical variation consequent on fluctuation in the cost of living.

Outfit Grant.—An Officer on joining receives £50 as outfit allowance.

Marriage Allowance.—Officers of 30 years of age and over who are married are entitled to draw special rates of allowances.

A Voluntary Widows' and Orphans' Fund exists for Officers of the Corps.

A certain number of temporary Commissions will also be offered at the same time under the same conditions as regards age and qualifications as those required of candidates for permanent Commissions.

All particulars may be obtained by application, in writing or personally, to THE UNDER SECRETARY OF STATE, The War Office (A.M.D.1.), Whitehall, London, S.W.1.

Jewish Maternity Hospital,
Underwood-street, E.1.

Vacancies occur for CLINICAL ASSISTANTS. Candidates, who must be registered Practitioners, are admitted to the practice of the Hospital for a period of three months for the payment of £3 3s. Applications should be submitted to the Secretary.

Royal Chest Hospital, City Road,
E.C.1. (Royal Northern Group of Hospitals.)—The post of House Physician at this Hospital is now vacant. The appointment is for six months. Salary at the rate of £100 per annum, with board, residence, and laundry. Applications, with copies of testimonials, should be sent to the undersigned, from whom forms of application, rules, and further particulars can be obtained. GILBERT G. PANTER, Secretary.
Royal Northern Hospital, Holloway, N.7.

The Queen's Hospital for Children,
Hackney-road, London, E.2.
Telephone: Bishopsgate 6305 and 2534.

CLINICAL ASSISTANT required in the Orthopædic Department. Attendance every Thursday at 1.30 P.M. Lunch provided. Honorarium of 5s. per attendance to cover expenses. Applications, stating age, qualifications, and experience, should be addressed to the Secretary at the Hospital, and should be delivered on or before 10th July.
17th June, 1930. T. GLENTON-KERR, Secretary.

Miller General Hospital,
Greenwich-road, S.E. 10.

CASUALTY OFFICER (Male and unmarried) required. There are four other residents. Salary £150 per annum, with board, residence, and laundry. Duties to commence on or as soon after the 1st of July as possible.
Applications, stating age, nationality, qualifications, and experience, accompanied by copies of not more than three recent testimonials, to be sent to the Secretary as soon as possible.
June 18th, 1930.

Royal Northern Hospital,
Holloway, N.7.

Applications are invited for the following posts, vacant on 15th September.

OBSTETRIC HOUSE SURGEON for six months.

RESIDENT OUT-PATIENT CASUALTY OFFICER and ANÆSTHETIST for six months.

HOUSE SURGEON for nine months (six months as House Surgeon and three months as Casualty Officer).

Salary in each case at the rate of £70 per annum, with board, residence, and laundry.
Applications, with copies of testimonials, should be sent by 12th July to the undersigned, from whom forms of application and rules can be obtained. GILBERT G. PANTER, Secretary.

The Victoria Hospital for Children,
Tite-street, Chelsea, S.W.3. (138 Beds.)

The Committee of Management invite applications for the posts of HOUSE PHYSICIAN and HOUSE SURGEON (both vacant 1st August, 1930). The appointments are for six months. Salaries at the rate of £100 per annum, with board, lodging, and washing.
Candidates must attend the Hospital for the purpose of an interview at 4.30 P.M. on Friday, July 11th, 1930. (No travelling or other expenses will be paid.) They must hold medical and surgical qualifications, and be registered under the Medical Act.
Applications, with copies of three recent testimonials, should be sent to the Secretary not later than first post on Wednesday, 9th July, 1930. By order.
D. ST. JOHN BAMFORD, Secretary.

Ministry of Health.

The Minister of Health invites applications from registered Medical Practitioners for appointment as BACTERIOLOGIST at the GOVERNMENT LYMPH ESTABLISHMENT at Hendon.
The salary commences at £700 per annum, and rises by annual increments of £25 to £1000 per annum. In addition to the salary a bonus, which varies with the cost of living, is payable; the bonus on the minimum salary is at present £187 and is next subject to revision on the 29th September, 1930.
The appointment will carry the usual Civil Service conditions as to pension, holidays, &c., and the Bacteriologist will be required to devote his whole time to the public service.
Candidates must be registered medical men of not less than seven years' standing.
Canvassing Members of Parliament or Officers of the Ministry will render the candidate liable to disqualification.
Forms of application, with further particulars of the appointment, may be obtained from the Director of Establishments, Ministry of Health, Whitehall, S.W.1.
No application can be considered unless received on the prescribed form not later than the 14th July, 1930.

The Infants Hospital, Vincent-square,
Westminster.—The Committee of Management invite applications for the post of ANÆSTHETIST. Applications, with copies of not more than three testimonials, to be sent to the undersigned, from whom further information may be obtained.
ALFRED J. SMALL, Secretary.

Hospital for Consumption and Diseases
OF THE CHEST, Brompton, S.W.3.

The Committee of Management invite applications for the post of HOUSE PHYSICIAN (for which there are three vacancies). The duties include work in the Out-patient Department as well as in the Wards. Applications, with copies of testimonials, must reach the undersigned not later than Saturday, 12th July. The appointment is for six months, commencing on 1st August, with an honorarium of £50. FREDERICK WOOD, Secretary.
Brompton, 28th June, 1930.

Bolingbroke Hospital (121 Beds),
Wandsworth-common, S.W.11.

HOUSE PHYSICIAN (Male) required. The appointment is for six months, commencing on the 1st August next. Salary £120 per annum, with board, residence, and laundry.
Candidates must be fully qualified and registered.
Applications, stating age, qualifications, and experience, with copies of not more than three recent testimonials, should be sent to the undersigned on or before the 9th July, 1930.
W. S. RANDOLPH BISS, Secretary-Superintendent.

Bolingbroke Hospital (121 Beds),
Wandsworth-common, S.W.11.

Applications are invited for the post of RESIDENT MEDICAL OFFICER (Male).
The post is that of Senior Resident Officer, and the work being chiefly surgical preference will be given to candidates holding the F.R.C.S. qualification.
The appointment is for twelve months.
Salary £200 per annum, with board, residence, and laundry.
Applications, stating age, qualifications, and experience, with copies of not more than three testimonials, should be sent to the undersigned at once.
W. S. RANDOLPH BISS, Secretary-Superintendent.

South Eastern Hospital for Children,
Sydenham, S.E.26.

Applications are invited for the posts of TWO RESIDENT MEDICAL OFFICERS. The appointments will be for six months from July 7th. Honorariums £100 and £75 per annum, with board, residence, and laundry. Ample time for reading. Applications, by letter only, stating age and qualifications, with copies of testimonials, should be sent to the Hon. Secretary, WALTER MASON, M.B.E., "Woodfield," Dacres-road, Forest Hill, S.E.23, at once.

Central London Throat, Nose, and
EAR HOSPITAL, Gray's Inn-road, W.C.1.

RESIDENT HOUSE SURGEON (MALE).

There will be a vacancy for a Third Resident House Surgeon to enter on duty on 1st September next.
The appointment will be for a period of nine months, three months as Third House Surgeon, three months as Second House Surgeon, and three months as First House Surgeon.
Remuneration at the rate of £75 per annum.
Applications for this appointment, accompanied by copies of not more than three testimonials, should be sent to the undersigned on or before 5th July, 1930.
JOHN H. YOUNG, Secretary-Superintendent.

The Hospital for Sick Children,
Great Ormond-street, London, W.C.1.

A MEDICAL REGISTRAR AND PATHOLOGIST is required on the 1st October, 1930.
Gentlemen are invited to send in their applications, addressed to the Secretary, with copies of not more than three testimonials written specially for the purpose, before 12 o'clock on Monday, the 14th July, 1930.
The appointment is made for one year, but may be held, subject to re-election, for three years.
Salary £300 per annum, with luncheon and dinner when on duty, and an allowance of eighteen guineas for the purpose of providing a substitute during annual leave.
Candidates must be registered Medical Men, and must have held a responsible Hospital appointment, and be prepared to take up the duties on the 1st October, 1930.
All candidates must be in attendance at the Hospital to appear before the Joint Committee, if necessary, on Wednesday, the 16th July, 1930, at 4.45 P.M.
Forms of application and copies of the Rules for, and details of the duties of, the appointment will be supplied on application to the Secretary. By order of the Board of Management.
June, 1930. JAMES MCKAY, Secretary.

Golden-square Throat, Nose, and EAR HOSPITAL, London, W.1.

HOUSE SURGEON (Male) required for 1st August, 1930. Salary £100 per annum, with board and lodging. Applications, stating age, qualifications, and experience, together with copies of three testimonials, should reach the undersigned on or before 7th July. F. P. CARROLL, Secretary-Superintendent.

The Prince of Wales's General HOSPITAL, Tottenham, N.15.

An additional CLINICAL ASSISTANT is required in the Surgical Departments of the above Hospital, to attend on Thursday afternoons.

Applications, together with copies of three recent testimonials, to be sent on or before the first post on Wednesday, July 2nd next, to J. C. BURDETT, Director.

June 23rd, 1930.

Poplar Hospital for Accidents, East India Dock-road, Poplar, E.14.

The Committee invites applications for the appointment of SECOND RESIDENT OFFICER at a salary at the rate of £175 per annum, all found. Candidates must have held appointments as House Surgeon at a Hospital. Applications must be accompanied by a statement of the candidate's qualifications, and be forwarded to the Secretary, with three recent testimonials, not later than Thursday, July 10th, 1930. The appointment is for a period of six months.

Mildmay Mission Hospital, Austin-street, Bethnal Green, E.2.

—Applications are invited for the post of ASSISTANT CASUALTY OFFICER (Female), which becomes vacant on Sept. 1st. The appointment is non-resident and for six months. Salary £100 per annum.

Candidates must be registered under the Medical Acts, and the Mildmay Council is anxious that they should be fully in sympathy with the religious work of the Hospital.

Applications, with copies of recent testimonials, should be sent to the Medical Superintendent immediately.

Royal Free Hospital, Grays Inn-road, W.C.1.

Applications are invited for the post of RESIDENT ANÆSTHETIST to the Gynæcological and Obstetric Unit. Salary £150 per annum. Candidates, who must be fully qualified and experienced, should send applications, stating age, accompanied by copies of three recent testimonials, to the undersigned on or before the 5th prox. The appointment is made for a period of six months but renewable. Preference will be given to candidates who have held resident posts.

REGINALD R. GARRATT, Secretary.

Queen Mary's Hospital for the East End, Stratford, E.15. Telephone: Maryland 2616.

Applications are invited from fully qualified and registered Medical Men for the following post:—

One HOUSE PHYSICIAN AND CASUALTY OFFICER.

Salary £150 per annum.

The Hospital contains 216 beds, including 46 Maternity beds, and other special departments.

Candidates, who should have previously held Hospital appointments, must send applications, accompanied by testimonials, to the undersigned not later than Thursday, the 3rd July, 1930. RAPHAEL JACKSON, Major, Secretary.

The Royal Borough of Kensington.

TEMPORARY TUBERCULOSIS OFFICER.

The Council of the Royal Borough of Kensington are prepared to accept applications for the appointment of a Male Medical Officer, with experience of tuberculosis work, to act as Holiday Locum at the Kensington Tuberculosis Dispensary, 119, Ladbroke-grove, W.11, for one month as from 1st September. Sessions: six morning, four afternoon, and one evening per week. Honorarium 35 guineas.

Applications must be delivered to the Medical Officer of Health, Town Hall, Kensington, W.8, not later than 5th July.

HORACE RAPSON, Town Clerk.

Town Hall, Kensington, W.8, 23rd June, 1930.

Evelina Hospital for Children, Southwark, S.E.

—The Committee of Management requires a HOUSE SURGEON (Male) for seven months from 12th July (during first three months duty in Casualty and O.P. Dept.). Salary at £120 per annum, with board and residence.

Candidates (duly registered) to send applications, giving age and qualifications (with dates), and copies of four testimonials, to the Secretary at the Hospital before 7th July.

Applicants will be informed if they will be interviewed by the Medical Committee. Selected candidates must attend Committee of Management. Time and place of meeting will be notified by the undersigned, from whom rules and other particulars relating to the post must be obtained.

By order of Committee of Management.

H. C. S. SMITH,

23rd June, 1930. Secretary-Superintendent.

Huntingdon County Hospital.

HOUSE SURGEON (Male) required at once. Salary £125, with board, residence, and laundry.—Apply, W. R. GROVE, M.D.

Royal Hospital, Richmond, Surrey.

JUNIOR HOUSE SURGEON (Male) required to take up duties early in September. Salary at the rate of £100 per annum, with board, furnished apartments, and washing. Candidates must be fully qualified and registered and single. The appointment will be for six months, after which the successful candidate will be eligible for the senior post. Applications, stating age, experience, and copies of three recent testimonials, must be forwarded to me as soon as possible.

RICHARD ALLEN, Secretary.

Royal Hampshire County Hospital, Winchester.

HOUSE PHYSICIAN.

Applications are invited from fully qualified men for the above post, which is tenable for six months from 1st July. Salary £150 per annum, with board, residence, and laundry. Candidates, who must have had Ophthalmic experience and be of British nationality, should make application at once to the undersigned, enclosing copies of three testimonials.

24th June, 1930. HERBERT MASLEN, Secretary.

Leeds Public Dispensary.—Wanted,

JUNIOR RESIDENT MEDICAL OFFICER. Salary £150 per annum, with board, residence, and four shillings weekly for laundry. Separate sitting-room. Applications, with copies of three recent testimonials, to be addressed to the Secretary of the Faculty, Public Dispensary, North-street, Leeds.

County Borough of Bolton.

EDUCATION COMMITTEE.

ASSISTANT MEDICAL OFFICER OF HEALTH AND ASSISTANT SCHOOL MEDICAL OFFICER.

The Education Committee invite applications for the appointment of a Male Assistant Medical Officer of Health and Assistant School Medical Officer.

The person appointed will be required to assist the Schoo Medical Officer in carrying out the work of the medical examination of school-children under the Education Act, 1921, and also, when not required in school work, to assist the Medical Officer of Health in Public Health work, if required so to do. He must be prepared to devote the whole of his time to the duties of the office and not engage in private practice.

Preference will be given to applicants who

(*a*) have had some definite experience in School Hygiene; and

(*b*) have enjoyed special opportunities for the study of children.

The possession of a Diploma in Public Health is essential.

Salary £500 per annum, rising by £25 per annum to a maximum of £700 per annum in accordance with the national scale.

Applications, endorsed "Assistant Medical Officer," stating age, qualifications, and previous experience, and accompanied by not more than three recent testimonials, must be sent to the undersigned not later than Saturday, 12th July, 1930.

Canvassing, either directly or indirectly, will be a disqualification. F. WILKINSON, Director of Education.

Education Offices, Nelson-square, Bolton, Lancs.

Rhondda Urban District Council.

ASSISTANT MEDICAL OFFICER.

The above Council invite applications from Male registered Medical Practitioners to act as whole-time Assistant Medical Officer of Health and Assistant School Medical Officer, under the direction, supervision, and control of the Council's Medical Officer of Health, at a salary of £500, rising by annual increments of £25 to £700 a year, together with travelling expenses necessarily incurred in the performance of the duties.

Candidates must have had not less than three years' professional experience subsequent to registration, and the possession of a Diploma in Public Health is desirable.

The duties will pertain to both public health and school medical services, but experience in the work of school clinics, including the examination and certification of defective children, orthopædic work, X ray and ultra-violet radiation, and general anæsthesia for dental and throat operations will be considered to be of special importance.

The appointment will be subject to two calendar months' notice on either side, and to the approval of the Board of Education. The officer appointed will be required to reside within the Rhondda Urban District and will not be allowed to engage in private practice.

The selected candidate may be required to pass a medical examination, and should the position become a designated post under the Local Government and Other Officers' Superannuation Act, 1922, during the tenure of the successful applicant, the necessary deductions will be made from the salary.

Applications are to be made on forms obtainable from the Medical Officer of Health, Tydfil House, Llewelyn-street, Pentre, Rhondda, by whom they must be received, endorsed "Assistant Medical Officer," and accompanied by copies of three recent testimonials, not later than the first post on Tuesday, the 8th July, 1930. D. J. JONES, Clerk of the Council.

The Council Offices, Pentre, Rhondda, 24th June, 1930.

The County Hospital, York.

Applications are invited for the post of RESIDENT ANÆSTHETIST, who will also be required to assist the House Surgeon. Salary £150, with board and residence. Duties begin Augst 1st. Applications, stating age and experience, together with copies of not more than three recent testimonials, to be sent to the Manager not later than July 1st.

The Sheffield Royal Hospital.

RESIDENT ANÆSTHETIST required (Male). Salary for the first six months at the rate of £80 per annum, after which £100 per annum, with board, residence, and laundry. There are twelve resident medical officers. Applications should be forwarded at once to

W. H. BOOTH, Superintendent and Secretary.

Royal Infirmary, Wigan. (180 Beds.)

Wanted, July 1st, for six months, TWO HOUSE SURGEONS. Salary £150 per annum, with board, apartments, and washing. Doubly registered. Applications, stating age, nationality, and qualifications, with copies of three recent testimonials, to reach the undersigned as soon as possible. A. STANLEY BRUNT.

2nd June, 1930. General Superintendent and Secretary.

Royal Infirmary, Wigan. (180 Beds.)

RESIDENT MEDICAL AND SURGICAL OFFICER AND REGISTRAR.

Applications are invited for the above post. Candidates must be qualified and registered and have held previous resident appointments at a Hospital. The salary is at the rate of £250 per annum, with board, residence, and laundry. The appointment is tenable for one year, and the officer is eligible for re-election for a second year. The duties to commence on July 1st. Applications, giving proof of registration and not more than three testimonials, to be sent to the undersigned as soon as possible. A. STANLEY BRUNT,

2nd June, 1930. General Superintendent and Secretary.

General Infirmary, Salisbury.

(General Hospital, 151 Beds.)

HOUSE PHYSICIAN (Male) required, to commence duty at the end of July.

Candidates must be unmarried, fully qualified, and registered. Salary £150, with board, &c.

Applications, with copies of testimonials, to be sent to the House Governor and Secretary, from whom a copy of the Rules may be obtained on application.

General Infirmary, Salisbury.

(General Hospital, 151 Beds.)

Two HOUSE SURGEONS (Male) required to commence duty as soon as possible.

Candidates must be unmarried, fully qualified, and registered. Salary £150, with board, &c.

Applications, with copies of testimonials, to be sent to the House Governor and Secretary, from whom a copy of the Rules may be obtained on application.

County Borough of Bournemouth.

Applications are invited from Medical Men and Women willing to attend at the MALVERN-ROAD and WINTON INFANT WELFARE CENTRES. Each Centre has one session weekly, and the remuneration will be 1½ guineas for a session of approximately 2 hours.

Applications, endorsed "Welfare Centres," should be delivered to the undersigned not later than 10th July, 1930.

HERBERT ASHLING, Town Clerk.

Town Hall, Bournemouth, 25th June, 1930.

Papworth Village Settlement, near

Cambridge, for the Treatment of all Forms of Tuberculosis. Over 300 Beds (Male and Female).

Applications are invited for the post of HOUSE PHYSICIAN. Salary £100 per annum, with board, lodging, and laundry. The appointment is for six months.

Applicants must be Male and single, and all applications should be sent to the Medical Director, Papworth Village Settlement, Cambridge, accompanied by copies of not less than three testimonials.

Wrexham and East Denbighshire War

MEMORIAL HOSPITAL. (109 Beds.)

Two RESIDENT HOUSE SURGEONS (Male or Female) required at above Hospital, to commence on August 1st. Appointments for a period of not less than six months. Salaries £150 per annum, with board and laundry.

Applications, stating age, nationality, experience, and qualifications, accompanied by copies of three recent testimonials, to be sent to the undersigned not later than Friday, July 18th.

LESLIE SPENCER, Secretary.

Taunton and Somerset Hospital

(104 Beds), Taunton.

JUNIOR HOUSE SURGEON (Male) required. Two other Resident Officers. Appointment for six calendar months. Salary at the rate of £100 per annum, with board, residence, and laundry.

Applications, with testimonials, to F. J. J. STACEY, Secretary.

Norfolk and Norwich Hospital,

Norwich.

Applications are invited for the post of HOUSE SURGEON. Salary £120 per annum, with board, residence, and laundry. Preference will be given to a candidate who has held a previous Hospital appointment. Candidates (Male) who must possess registered qualifications, should forward applications, stating age, nationality, &c., together with copies of testimonials, to the undersigned not later than Tuesday, 8th July, 1930.

FRANK INCH, House Governor and Secretary.

27th June, 1930.

Bath, Somerset, and Wilts Central

CHILDREN'S ORTHOPÆDIC HOSPITAL, Combe Park, Bath.

Applications are invited for the post of HOUSE SURGEON.

The appointment will be for six months, with salary at the rate of £120 per annum, together with quarters, board, aud laundry.

Candidates must have had special experience in administering anæsthetics.

Applications, with copies of three recent testimonials, should be forwarded at once to the undersigned.

HAROLD J. FRICKER, Secretary.

The Gloucestershire Royal Infirmary

AND EYE INSTITUTION, Gloucester. (153 Beds.)

Applications are invited for the posts of HOUSE PHYSICIAN (Male), and SECOND HOUSE SURGEON (Male). Salaries £135 and £100 per annum, respectively, with board, residence, and laundry. (Four Resident Medical Officers.)

The appointments are for six months, which may be extended for similar periods by re-election from time to time.

Applications, stating age, qualifications, and nationality, with copies of not less than three recent testimonials, must be sent to the undersigned. The elected candidates will be required to enter upon their duties at once. F. J. SYMONS, Secretary.

June 26th, 1930.

City and County of Newcastle-upon-

TYNE.

CITY HOSPITAL FOR INFECTIOUS DISEASES.

RESIDENT MEDICAL ASSISTANT (MALE).

Wanted immediately, a Resident Medical Assistant (Male), who holds a registrable qualification in Medicine and Surgery (and preferably also in Public Health), and possesses a practical knowledge of Bacteriology. The holding of a previous resident appointment and some experience of general practice will be considered a recommendation.

Salary £350 per annum, with board, lodging, &c.

Applications, stating age, qualifications, and previous experience, to be forwarded, with copies of not more than three recent testimonials, to the Medical Officer of Health, Town Hall, Newcastle-upon-Tyne.

23rd June, 1930.

City of Plymouth.

MEDICAL SUPERINTENDENT.

AMENDED ADVERTISEMENT.

Applications are invited from duly qualified and registered Medical Practitioners for the post of Medical Superintendent of the PLYMOUTH CITY HOSPITAL.

The salary will be at the rate of £1000 per year, with an allowance of the sum of £250 in lieu of quarters, &c. No canvassing for this appointment is permitted, and any canvassing will disqualify the applicant. The appointment will be terminable by three months' notice on either side.

Personal experience in Hospital administration is essential. The appointment is whole time and private practice is not permitted. The person appointed will be an Assistant Medical Officer in the Public Health Department, and will be on the staff of the Medical Officer of Health, who is the General Medical Superintendent of the Corporation Hospitals.

Applications will be considered only on the forms of application which will be provided. A form of application, together with further details relating to the appointment, can be obtained from the undersigned, on receipt by him of a request for this, accompanied by a stamped and addressed foolscap envelope. Forms of application, duly completed, together with copies of not more than three recent testimonials, must be returned to the undersigned not later than Saturday, 12th July, 1930.

A. T. NANKIVELL, M.D., M.R.C.P., D.P.H., &c.,
Medical Officer of Health.

Town Hall, Stonehouse, Plymouth, 21st June, 1930.

Birmingham Public Health DEPARTMENT.

TUBERCULOSIS SECTION.

TEMPORARY APPOINTMENT.

Applications are invited from single Male Medical Practitioners for the post of Temporary Assistant Medical Officer for a period of four months. The successful candidate will be employed both in a Sanatorium and in a Dispensary. Salary at the rate of £7 7s. weekly, with board, residence, and laundry. Forms of application may be obtained from the Chief Clinical Tuberculosis Officer, 44A, Broad-street, Birmingham.

F. H. C. WILTSHIRE, Town Clerk.

The Royal Hospital, Wolverhampton.
(Incorporated under Charter.)

CASUALTY OFFICER AND HOUSE SURGEON to Ear, Throat, and Nose Department (Male) required. Duties to commence forthwith.

The Hospital contains 240 beds, contains the usual special departments, and is recognised by the various Examining Bodies for a part of the requisite attendance on Medical and Surgical practice.

Candidates must be registered under the Medical Acts, and unmarried.

The appointment is for six months, with eligibility for further appointment for six months as House Surgeon to In-patients.

Salary at the rate of £125 per annum, board, furnished rooms, and laundry provided.

Applications, with copies of testimonials, to be forwarded to the undersigned.

W. H. HARPER,
18th June, 1930. House Governor and Secretary.

Ministry of Pensions.

BIRMINGHAM PENSIONS HOSPITAL COMMITTEE.

HIGHBURY HOSPITAL, MOSELEY, BIRMINGHAM.

Applications are invited for the post of RESIDENT ASSISTANT MEDICAL OFFICER at the above Hospital.

The cases treated are Surgical (mainly Orthopædic) and Medical. Salary £300 per annum, with lodging, fuel, and light. The appointed candidate to be prepared to take up duty early in August.

Candidates selected for interview will be required to pay their travelling expenses. Applications, stating age, experience, and War service (if any), together with copies of recent testimonials, to be received not later than Tuesday, 15th July, addressed to Chairman of the Committee, Highbury Hospital, Moseley, Birmingham.

City of Manchester Education COMMITTEE.

ASSISTANT SCHOOL MEDICAL OFFICER.

Applications are invited from fully qualified Medical Practitioners for the post of Assistant School Medical Officer.

Applicants must have been qualified three years and will be required to devote their whole time to the duties of the office. Preference will be given to those who have special knowledge in the diagnosis and treatment of Diseases of the Ear, and experience in the prescription of spectacles.

The salary is £600 per annum, rising by yearly increments of £25 to a maximum of £750. There is also a yearly allowance of £10 for travelling expenses.

The person appointed will be required to contribute to the Superannuation Scheme of the Corporation.

Forms of application may be obtained from the undersigned, and applications should be returned not later than Saturday, 12th July, 1930.

GEORGE GUEST, Acting Director of Education.
Education Offices, Deansgate, Manchester.

Warwickshire County Council.

ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH.

Applications are invited from qualified and registered Medical Practitioners for the post of Assistant County Medical Officer of Health. The duties will include medical inspection of school-children.

The salary is at the rate of £500 per annum, rising by annual increments of £25 to a maximum of £700 per annum, and is subject to a deduction of five per cent. in respect of contributions under the Local Government and Other Officers' Superannuation Act, 1922. In addition, motor car allowances in accordance with the Council's scale and reasonable travelling expenses are paid. The appointment is subject also to the production of a medical certificate satisfactory to the County Medical Officer of Health. Preference will be given to one who holds a Diploma in Public Health.

Forms of application and statement of the duties and terms of the appointment can be obtained from the undersigned.

Applications (marked "Assistant County Medical Officer of Health"), with copies of not more than three recent testimonials, must be received by me not later than Monday, the 14th July, 1930.

Canvassing, directly or indirectly, will be considered a disqualification. L. EDGAR STEPHENS, Clerk of the County Council.
42, Warwick-street, Leamington, 20th June, 1930.

Harrogate Infirmary. — Applications

are invited from British subjects (Male) for the post of JUNIOR HOUSE SURGEON, now vacant. Applications to be made on official form to be had from the undersigned.

GEO. BALLANTYNE, Secretary.

Free Eye Hospital, Southampton.

The Committee require the services of a duly qualified HOUSE SURGEON to enter on duties immediately. Salary £150 per annum, with board, residence, and laundry. Applicants must have had post-graduate experience in Ophthalmology. Applications, with three recent testimonials, to reach the Secretary by Wednesday, 2nd July, 1930.

Royal Cornwall Infirmary, Truro.
(84 Beds.)

HOUSE SURGEON (Male) required with experience of X-ray work and Anæsthetics. Salary £170 per annum, rooms, board, and washing. Apply, with copies of three recent testimonials, to the Secretary, of whom further particulars may be obtained.

Royal United Hospital, Bath.

Wanted, a HOUSE PHYSICIAN, salary £120 per annum. The appointment will be for not less than six months, and candidates must be Male, unmarried, and of British nationality. Applications, with three testimonials, must be sent immediately, addressed to the undersigned.

GERALD A. KENYON,
Asst. Secretary.

Leicester Royal Infirmary.

RESIDENT MEDICAL APPOINTMENTS.

A casual vacancy has arisen for a HOUSE SURGEON, and the Resident Casualty Officer is a candidate. If he is elected a vacancy will occur for a Resident Casualty Officer. Applicants must have held a resident Hospital post or had similar experience of Hospital work. Salary at the rate of £125 per annum, for a six months' appointment. Applications to the House Governor and Secretary on or before Tuesday, 1st July, 1930.

14th June, 1930.

The Hospital for Sick Children,
Newcastle-upon-Tyne.

The Committee of Management have declared a vacancy for an HONORARY SURGEON.

Applications, stating age and qualifications, are invited for this appointment and should be sent to the Secretary, Mr. NEIL BRODIE, 18, City-road, Newcastle, accompanied with copies of three recent testimonials, on or before 7th July, 1930. Canvassing a disqualification.

Royal Infirmary, Doncaster.
(185 Beds.)

OPENING NEW BUILDINGS.

Three HOUSE SURGEONS and One HOUSE PHYSICIAN required at once. New building ready for occupation. The House Physician will also be House Surgeon to Ophthalmic and Ear, Nose, and Throat Departments.

The salary of each post is £150 per annum, with board, residence, and laundry.

Appointments are for six months and are renewable.

Applications, stating age and full particulars, together with copies of testimonials, should be sent at once to the Secretary-Superintendent.

County of Hertford.

APPOINTMENT OF ASSISTANT LADY MEDICAL OFFICER OF HEALTH FOR MATERNITY AND CHILD WELFARE SERVICES.

The County Council of the Administrative County of Hertford invite applications for the above-mentioned appointment.

Applicants must not be more than forty years of age. Salary £600 per annum. Actual and necessary travelling expenses will be provided.

Candidates must be fully qualified and registered, and should have had previous experience in Maternity and Child Welfare work, including modern methods of antenatal care and supervision.

The person appointed will be required to commence her duties at an early date and to devote the whole of her time to the duties of the office. She will hold office during the pleasure of the County Council, and if she desires to leave their service must give them three months' notice of her desire so to do.

Applications should be sent to the undersigned not later than the 18th July, 1930.

The applicant appointed will be required to sign an agreement containing the terms and duties of her appointment.

The appointment will be subject to the provisions of The Local Government and Other Officers' Superannuation Act, 1922, which has been adopted by the County Council.

A form of application can be obtained from the undersigned.

ELTON LONGMORE,
Clerk of the Hertfordshire County Council.
Clerk of the Peace Office, Hertford, June, 1930.

EAST AFRICAN MEDICAL SERVICE

VACANCIES at present exist for MEDICAL OFFICERS in the EAST AFRICAN MEDICAL SERVICE.

QUALIFICATIONS.—Candidates must be British subjects of European parentage and under 35 years of age. They must possess a double qualification and be on the British Medical Register. Preference will be given to candidates who have held hospital or public health appointments, or who have special knowledge of anæsthetics, radiology, surgery, medicine, ophthalmology, gynæcology and midwifery, diseases of the ear, nose and throat, venereal diseases, &c.

SALARY.—£600 per annum, rising by annual increments of £30 to £840 per annum, and thence, subject to an efficiency bar, by £40 to £920 per annum.

QUARTERS.—Free quarters are provided or an allowance is given in lieu.

PASSAGES.—Free first-class passages are provided both on first appointment and when proceeding on or returning from leave. A married officer will be granted an allowance towards the cost of his family's passage once each way in respect of each tour of service.

TERMS OF APPOINTMENT.—The appointments are pensionable, subject to a probationary period of two years in the first instance.

LENGTH OF TOUR OF SERVICE.—The normal tour of service is 20 to 30 months, after which leave is granted with full salary for 2½ to 3½ days, according to the districts in which the officer has served, for each month of service, plus the period of the voyage to England. If the officer is returning to East Africa for further service, he receives a further similar amount of leave, plus the period of the voyage to East Africa.

COURSE OF INSTRUCTION IN TROPICAL MEDICINE.—Selected candidates will normally be required to undergo a course of instruction in Tropical Medicine and Hygiene before proceeding overseas.

DUTIES.—Though Medical Officers are appointed in the first instance for general service, there are good opportunities for work in special branches of medicine and surgery and for research.

Further particulars and forms of application may be obtained on application in writing from the Private Secretary (Appointments), Colonial Office, 2, Richmond Terrace, Whitehall, London, S.W 1.

EGYPTIAN GOVERNMENT.

Egyptian University.

FACULTY OF MEDICINE.

Applications are invited for the newly created chair of PROFESSOR OF HYGIENE. Applicants must have a University Medical qualification, and at least ten years' experience of Public Health work, preferably in a Tropical Country. Candidates must have a recognised qualification in Public Health, and preferably a qualification in Tropical Medicine and Hygiene. They must have held a post in a recognised institute.

The duties of the professsor include giving a course of instruction to Undergraduates and a Post-graduate course for the Diploma of Public Health and Tropical Medicine. He will also conduct research work. The language of instruction is English.

The salary offered is £E.1500 (approximately £1538) a year, and the appointment will be on contract for three years, renewable. The contract may be terminated by either side by three months' notice in writing.

One month's salary will be paid in lieu of travelling expenses if the successful applicant is resident in Europe.

If an official of the Egyptian Government is selected for the post he will not receive the advertised salary unless it is sanctioned by the Financial Authorities.

Applications, with copies of Published Research and copies of testimonials, should be addressed to the Dean of the Faculty of Medicine, Egyptian University, Cairo, so as to be received by him not later than September 20th, 1930.

Further details may be secured by application to the Dean.

The post of Assistant Professor of

ANATOMY in the UNIVERSITY OF MANITOBA will be vacant from October 1st, 1930. Salary 3500 dollars (200 in lieu of passage). Applications, with two or three testimonials, should reach me before August 9th, 1930.

S. W. PROWSE, M.D.
Dean, Faculty of Medicine, Medical College, Winnipeg, Canada.

Newark General Hospital

(50 beds).—Wanted, a fully qualified RESIDENT HOUSE SURGEON (Male or Female, unmarried). Salary £150 per annum, with board, residence, and laundry. Appointment for six months or twelve if mutually desired. For form of application apply to W. T. Crampton, 27, Kirk Gate, Newark, Notts.

The Jessop Hospital for Women,

Sheffield.
GYNÆCOLOGICAL AND MATERNITY DEPARTMENTS.
(145 Beds.)

The Board of Management invite applications for the appointment of three ASSISTANT HOUSE SURGEONS (Male) for six months from July 15th, 1930.

Salary £100 per annum, together with board, residence, and laundry.

Applications, stating age, together with copies of recent testimonials, should reach the undersigned on or before July 1st.

H. B. SHELSWELL, Secretary.

The Royal Infirmary, Sheffield.

(500 Beds.)

The Weekly Board of Management invite applications for the post of HOUSE SURGEON.

The salary attached to the appointment (which will terminate on 30th September next) is £80 per annum, with board and residence.

Applications, with copies of testimonials, should be addressed to the undersigned forthwith.

JNO. W. BARNES, F.C.I.S.,
General Superintendent and Secretary.

Board Room, 14th May, 1930.

The Royal Infirmary, Sheffield.

(500 Beds.)

The Weekly Board of Management invite applications for the undermentioned posts:—

HOUSE SURGEON.
OPHTHALMIC HOUSE SURGEON.
ASSISTANT AURAL AND OPHTHALMIC HOUSE SURGEON.

The appointments will be tenable for six months from July 1st, 1930. The salary attached to each post is £80 per annum, rising after six months' service to £100 per annum, together with board and residence.

Applications, together with copies of testimonials, to be sent to the undersigned immediately.

JNO. W. BARNES, F.C.I.S.,
General Superintendent and Secretary.

Board Room, 23rd June, 1930.

INDIAN MEDICAL SERVICE

RECRUITMENT OF EUROPEAN OFFICERS

Applications are invited from Medical Men for permanent commissions in H.M.'s Indian Medical Service. The Terms offered include a gratuity of £1,000 on retirement after six years' service or £2,500 after 12 years' service, together with free return passages for those who no longer desire to remain in the Service. In other respects the terms will be as detailed below.

Candidates must be British subjects under 32 years of age at the time of application and must be registered under the Medical Acts in force in Great Britain and Northern Ireland.

CAREERS.

The Indian Medical Service offers wide opportunities of medical experience, including clinical, preventive, specialist, and research work. At the beginning of his career an officer is employed on the military side which has medical charge of the Indian Army. Promotion is on a time scale up to the rank of Lieutenant-Colonel, and by selection to the ranks of Colonel and Major-General. An officer may apply after two years' Indian Service to have his name registered for transfer to the civil side, from which appointments are made to Civil Surgeoncies, which are established at the principal civil centres to provide for the medical needs of Civil Officials and for general medical administrative purposes; to specialist (e.g., Public Health and Bacteriological) services; to research posts; and to professorships at the Medical Schools.

PAY.

The monthly rates of pay for European officers in the Service who have a "non-Asiatic" domicile are as follows :—

Rank.	Service in Rank.	Basic Pay.	Overseas Pay.	Year of Total Service.
1	2	3	4	5
		Rs.		
Lieut...	—	500	Rs.150	1st
			150	2nd
			150	3rd
Capt...	(i) During first 3 years' service as Captain ..	650	150	4th
			£15	5th
			15	6th
	(ii) With more than 3 and less than 6 years' service as Captain	750	25	7th
			25	8th
			25	9th
	(iii) With more than 6 years' service as Captain	850	25	10th
			25	11th
			30	12th
Major ..	(i) During first 3 years' service as Major ..	950		
	(ii) With more than 3 and less than 6 years' service as Major	1100		
	(iii) With more than 6 years' service as Major..	1250		
Lt.-Col.	(i) Until completion of 23 years' total service ..	1500	30	13th and over.
	(ii) During 24th and 25th years' service	1600		
	(iii) After completion of 25 years' total service ..	1700		
	(iv) When selected for increased pay	1850		

Extras.—In addition to the above rates various allowances are admissible for a large number of special appointments on both the military and the civil side which may be held by members of the Indian Medical Service. Special high rates of pay are also attached to the numerous administrative appointments open to officers in both branches of the Service.

ANTEDATES IN COMMISSION.

Any service rendered by an officer during the War as a medical or combatant officer or in a position usually filled by an officer may be counted as service for increments of pay, promotion, retirement and retired pay, but not for gratuity.

One half of any service in the ranks during the War may be counted as service for retirement and retired pay only.

Candidates possessing certain higher medical qualifications may be granted an antedate of one year in their commissions. Past service in certain hospital appointments may also render candidates eligible for an antedate of one year. Persons holding or about to hold resident posts at recognised hospitals may be seconded in those posts for a period not exceeding one year. The maximum period of antedate, secondment, or antedate and secondment combined, admissible under this paragraph, is limited to one year.

OUTFIT ALLOWANCE.

Officers on appointment will receive an outfit allowance of £50.

PRIVATE PRACTICE.

With the exception of Administrative Officers, military or civil, and officers holding certain special appointments, officers are not debarred from taking private practice, so long as it does not interfere with their proper duties.

PENSIONS.

The rates of pension are as follows : —

				Per annum.
After	17	years' service for pension	..	.. £400
,,	18	,, ,,	..	.. 430
,,	19	,, ,,	..	.. 460
,,	20	,, ,,	..	.. 500
,,	21	,, ,,	..	.. 540
,,	22	,, ,,	..	.. 580
,,	23	,, ,,	..	.. 620
,,	24	,, ,,	..	.. 660
,,	25	,, ,,	..	.. 700
,,	26	,, ,,	..	.. 750
,,	27	,, ,,	..	.. 800

These rates are subject to alteration on account of a rise or fall in the cost of living as compared with the year 1919, to an extent not exceeding 20 per cent. in all, the revision being undertaken triennally. With effect from July 1st, 1927, a reduction of 4½ per cent. has been made on this account from the amounts shown.

There are additional pensions ranging from £65 to £350 per annum for officers who have held administrative appointments.

PASSAGES.

An officer on appointment is provided with free passage to India. The wives and families of officers who are married prior to the date of the officers' embarkation on first appointment will also be provided with free passage to India subject to the payment of messing charges.

Officers and their families are also eligible for passage concessions under which they are granted a certain number of return passages home at Government expense during their service.

INSTRUCTION PRIOR TO EMBARKATION.

Officers are required to undergo courses of instruction at the Royal Army Medical College and at Aldershot, lasting approximately six months, prior to their embarkation for India on first appointment.

Full details regarding these appointments and forms of application may be obtained from the UNDER-SECRETARY OF STATE FOR INDIA, MILITARY DEPARTMENT, INDIA OFFICE, LONDON, S.W.1.

The Selection Committee will meet at the India Office in July, and the selected candidates will be required to join a course of instruction commencing early in August, 1930.

Applications should be submitted as soon as possible.

Durham County and Sunderland Eye INFIRMARY.

—Wanted, a LOCUM for the above Institution for about 10 (ten) weeks from the 7th July. Must have good experience of Ophthalmic work.—Apply, with full particulars, to JOHN BUTTERFIELD, Secretary, Eye Infirmary, Stockton-road, Sunderland.

Hull Royal Infirmary (272 Beds).

Applications are invited for the post of THIRD HOUSE SURGEON (Male), vacant July 26th. Salary £150 per annum, plus board, residence, and laundry.

The appointment will be for six months in the first instance, and will be terminable by one month's notice on either side.

Applications, together with copies of testimonials, should be sent to the undersigned on or before July 5th.

June 16th, 1930. R. J. CARLESS, House Governor.

The Royal Infirmary of Edinburgh.

WHOLE-TIME MEDICAL REGISTRAR FOR STATISTICAL RESEARCH.

Salary £250 per annum.

The Statistical Research Committee of the Honorary Staff invite applications for the office of Medical Registrar to supervise and direct work in the Statistical Research Department to be established under their direction in the Royal Infirmary.

Applications, stating age, qualifications, and experience, to be forwarded to the Superintendent, Royal Infirmary, Edinburgh.

Staffordshire County Council. COUNTY BACTERIOLOGICAL LABORATORY.

A BACTERIOLOGIST is wanted for one calendar month to act as Locum Tenens at the above Laboratory, Stafford.

The person appointed must be a registered Medical Practitioner and must have had experience in the general routine of a Public Health Laboratory, including the Wassermann Reaction.

Remuneration at the rate of twelve guineas per week, and necessary travelling expenses.

Applications should be addressed to the undersigned.

EUSTACE JOY, Clerk of the County Council.

County Offices, Stafford, 16th June, 1930.

The Guest Hospital and Eye INFIRMARY, Dudley. (General Hospital, 104 Beds.)

Applications are invited for the post of ASSISTANT HOUSE SURGEON. Salary £150 per annum, according to experience, with furnished apartments, board, and laundry. Candidates must be fully qualified and registered. Applications, stating age, qualifications, and experience, and accompanied by copies of testimonials, to be sent to the undersigned.

H. RAYMOND HURST, Secretary.

The Guest Hospital, Dudley, June 14th, 1930.

County Borough of Warrington.

WHITECROSS HOSPITAL. (300 Beds.)

Applications are invited for the post of SECOND RESIDENT MEDICAL OFFICER (Male).

Salary £225 per annum, together with board, residence, and laundry at the Hospital.

The above is a General Hospital recently transferred to the Local Authority from the Board of Guardians, and the duties of the candidate appointed will chiefly comprise the treatment of patients in the Male Medical and Surgical, and Male and Female Mental Wards. Candidates must be single, not exceeding thirty years of age, fully qualified and registered.

Appointment for six months, which may be extended by one further period of six months.

Applications, stating age, qualifications, and experience, together with copies of not less than three testimonials, to be sent to the undersigned not later than first post Tuesday, 8th July, 1930. G. W. N. JOSEPH, M.D., D.P.H., Medical Officer of Health.

Health Department, Sankey-street, Warrington.

Royal Infirmary, Blackburn. (240 Beds, 5 Residents.)

RESIDENT HOUSE PHYSICIAN (Male) required at a salary of £175 per annum, with board, residence, laundry, &c. In addition to Medical Wards, to be attached to Eye, Ear, Nose, and Throat Department. To commence duties as early as possible.

Applications, with copies of testimonials, stating age, nationality, experience, &c., to be sent at once to the undersigned.

NATHAN A. SMITH, General Superintendent and Secretary.

Royal Infirmary, Blackburn.

This Institution is recognised for the Surgical practice required for the F.R.C.S. Final Examination.

Bristol Royal Infirmary.

Applications are invited for the post of HONORARY REGISTRAR to the Ear, Nose, and Throat Department. Candidates must be Doctors of Medicine or Graduates of one of the Universities of Great Britain or Ireland, or Fellows, Members, or Licentiates of the Royal College of Physicians of London, Edinburgh, or Ireland. Applications to be sent to the undersigned on or before July 12th, 1930.

ELLIS C. SMITH, F.C.I.S., Secretary and House Governor.

Bristol Royal Infirmary.

Applications are invited for the post of HONORARY ASSISTANT RADIOLOGIST. Candidates must be Doctors of Medicine or Graduates of one of the Universities of Great Britain or Ireland, or Fellows, Members, or Licentiates of the Royal College of Physicians of London, Edinburgh, or Ireland. Applications to be sent to the undersigned on or before July 12th, 1930.

ELLIS C. SMITH, F.C.I.S., Secretary and House Governor.

Salford Royal Hospital (263 Beds).

Applications are invited for the following vacancies in the Resident Medical Staff (Male):—

HOUSE PHYSICIAN. Salary at the rate of £125 per annum.

CASUALTY HOUSE SURGEON. Salary at the rate of £125 per annum.

The appointments are for a period of six months, with board and residence.

Candidates must be registered under the Medical Acts.

The Hospital has the approval of the Royal College of Surgeons of England and appointments here are recognised for the English Fellowship (Final).

Forms of application, which may be obtained from the undersigned, must be delivered without delay.

By order of the Board.

GEORGE RUDDLE, General Superintendent and Secretary.

Salford Royal Hosptal, June 23rd, 1930.

Chesterfield and North Derbyshire ROYAL HOSPITAL. (190 Surgical and Medical Beds.)

HOUSE SURGEONS.

Applications are invited from fully qualified Men for the above posts, which become vacant on the 31st July.

The appointments are for six months.

Salary is from £100 to £175 per annum, according to experience, with board, apartments, and laundry.

Applications, stating age, together with copies of three recent testimonials, should be sent to the undersigned not later than Friday, July 4th.

G. SUNNUCK, Superintendent and Secretary.

16th June, 1930.

City of Birmingham.

SELLY OAK HOSPITAL.

SURGEON.

Applications are invited from fully qualified registered Medical Practitioners for the above whole-time appointment.

The present Hospital accommodation is 550 beds, divided into General Medical, General Surgical, Gynæcological, Obstetrical and Children's Disease sections. There are completely equipped Pathological and Biochemical laboratories, X-ray, Electro-therapeutic, Massage, Ultra-violet Ray and Electro-cardiographic departments. Over 3000 operations are performed annually.

Candidates for the appointment must have had good Surgical experience, and be Fellows of the Royal College of Surgeons (England).

The scale of salary will be £700, rising by annual increments of £50 to a maximum of £1000 per annum.

Furnished quarters, rations, laundry, and attendance will be provided. Alternatively, a cash allowance will be paid if the officer appointed is non-resident. The officer appointed will be required to account to the Council for all fees, allowances, and emoluments (other than the foregoing) received by him.

The appointment will be subject to the Birmingham Corporation's Superannuation Scheme, and to the candidate passing a medical examination, and will be subject to three months' notice on either side.

Further particulars of the appointment may be obtained from the Medical Superintendent, R. P. STANLEY KELMAN, Esq., M.B., F.R.C.S. (Eng. and Edin.), at the Selly Oak Hospital. Applications, stating age, experience, and qualifications, accompanied by copies of recent testimonials, and endorsed "Surgeon," should be addressed to me and delivered at my office not later than 10 A.M. on Wednesday, 16th July, 1930.

F. H. C. WILTSHIRE, Town Clerk.

The Council House, Birmingham, June, 1930.

Worcester General Infirmary,
Worcester. (128 Beds.)

Wanted, a JUNIOR RESIDENT MEDICAL OFFICER, to commence duties on July 1st. Salary at the rate of £120 per annum, including board, residence, and laundry. Applications, together with three copies of recent testimonials and particulars of age and qualifications, to be forwarded immediately to the undersigned. PERCY N. GLASS, General Secretary.

The Mount Vernon Hospital,
Northwood, Middlesex.

The Council of Management will shortly proceed to the election of a GYNÆCOLOGIST. Candidates must be registered Fellows of the Royal College of Surgeons.

Applications, with copies of three testimonials, should be addressed to the undersigned.

WILLIAM J. MORTON, Secretary.

Offices: 7, Fitzroy-square, W.1.

North Staffordshire Royal Infirmary,
Stoke-on-Trent. (350 Beds.)
(A recognised Training School for Nurses.)

MATRON.

Applications are invited for the post of Matron. Candidates must be certificated Nurses, have had experience of training of Nurses, housekeeping, laundry supervision, and administration of a voluntary Hospital.

On receipt of a request, the House Governor will give all necessary particulars.

Applications for the appointment to reach the undersigned not later than Tuesday, July 8th, 1930.

W. STEVENSON, Secretary and House Governor.

Royal Halifax Infirmary.

Wanted, a THIRD HOUSE SURGEON (Male, unmarried).

Candidates must be duly qualified and registered. The appointment will be for a period ending 31st October, 1930. Probable promotion if satisfactory. Salaries of Resident Staff are as follows:—Resident Surgical Officer £250, First House Surgeon £175, Second House Surgeon £150, Third House Surgeon £125 per annum, with residence, board, and laundry.

The Hospital contains 230 beds, has a large Eye, Ear, Nose and Throat Department, Maternity Ward, and Pathological Laboratory. Particulars of the duties may be obtained from the undersigned, to whom applications, with copies of testimonials, should be sent. A. MIDGLEY, Secretary.

21st June, 1930.

Lancashire County Council.

BIDDULPH GRANGE ORTHOPÆDIC HOSPITAL.

The Lancashire County Council invite applications for the post of RADIOGRAPHER (non-resident) at the above Hospital.

The salary to be paid is £200 per annum, together with part board. Indoor uniform will also be provided after one month's service.

Candidates should possess a certificate in Radiography from the Society of Radiographers or from an approved training school.

The person appointed must be prepared to carry out such other duties in addition to Radiography as may be required.

The person appointed will be required to pass a medical examination and to contribute towards the Council's Superannuation Scheme.

The appointment will be terminable by one month's notice on either side.

Applications, stating age, full details of previous and present appointments and experience, certificates held, &c., and accompanied by copies of two recent testimonials, are to be sent to the Secretary, Biddulph Grange Orthopædic Hospital, nr. Stoke-on-Trent, not later than the 14th July, 1930. Envelopes should be endorse "Radiographer."

J. J. BUTTERWORTH,
County Medical Officer of Health and School Medical Officer.
Preston.

Lancashire County Council.

BIDDULPH GRANGE ORTHOPÆDIC HOSPITAL.

Applications are invited for the post of JUNIOR HOUSE SURGEON (Woman) at the above Hospital which contains 87 beds. Salary is at the rate of £150 a year, together with board, residence, and laundry.

The appointment will be for a period of six months in the first instance, and for a further period of six months at the option of the Council, but will not be renewable after that time.

Candidates must be duly qualified and registered. Preference will be given to candidates who have held resident hospital appointments, and who are competent anæsthetists.

Applications, with copies of two recent testimonials, should be sent not later than 14th July to Dr. J. J. BUTTERWORTH, School Medical and Child Welfare Department, County Offices, Preston. Duties to commence 1st August, 1930.

GEORGE ETHERTON, Clerk of the County Council.
County Offices, Preston, 21st June, 1930.

Swindon and North Wilts Victoria
HOSPITAL.

Wanted, a RESIDENT MEDICAL OFFICER (Male). Salary £125 per annum, with board, residence, and laundry. Candidates must be registered under the Medical Act. Appointment for the minimum of six months. Applications, stating age, &c., and accompanied by copies of not more than three recent testimonials, should be sent to the undersigned.

A. OAKLEY, Secretary.

Liverpool and District Hospital for
DISEASES OF THE HEART.

HOUSE PHYSICIAN (Male or Female) required for period of six months from July 1st. Salary at rate of £52 per annum with board and residence (private sitting-room).

Applications to Miss LEWIS, Secretary, 14, Cook-street, Liverpool.

Huddersfield Royal Infirmary.
(200 Beds.)

MALE SURGEON required to commence duty 20th July, 1930. Salary £150 per annum, with board, residence, and laundry. Appointment terminates 31st December, 1930, but is subject to renewal for further three or six months. Applications, with copy testimonials, to be addressed to the Secretary, Huddersfield Royal Infirmary.

Derbyshire Royal Infirmary, Derby.
(General Hospital, 346 Beds.)

Applications are invited for the post of OPHTHALMIC HOUSE SURGEON.

Candidates must be qualified and registered under the Medical Acts.

The appointment is tenable for twelve months. Salary will be £150 per annum, with apartments, board, &c.

There are 40 beds for Ophthalmic cases and a large Out-patient Department.

Applications, with copies of testimonials, to be sent to the undersigned. WALTER BANKS.

23rd June, 1930. Superintendent and Secretary.

Royal Salop Infirmary, Shrewsbury.
(150 Beds.)

APPOINTMENT OF RESIDENT SURGICAL OFFICER.

Applications are invited from fully qualified men for the appointment of Resident Surgical Officer, vacant immediately. The appointment is for a period of twelve months, at a salary of £200 per annum, with board, residence, &c.

The Resident Surgical Officer is Senior Resident Officer of the Hospital. House Staff comprises House Physician and House Surgeon.

Applications, stating age, qualifications, experience, nationality, and accompanied by copies of three recent testimonials, to be sent to the undersigned. J. W. NOBLE,

June 21st, 1930. Secretary-Superintendent.

Manchester Royal Infirmary

NON-RESIDENT HOUSE PHYSICIAN AND HOUSE SURGEON TO THE OUT-PATIENT DEPARTMENT.

The Board of Management of the Manchester Royal Infirmary invite applications for the above appointments.

Applicants, either sex, must be registered, and hold a Medical and Surgical qualification, preference being given to applicants who have held a Hospital appointment.

The appointments are for twelve months (six months as House Physician and six months as House Surgeon) and the duties are whole-time, except Sundays. Salary £200 per annum.

Applications, stating age, and testimonials to be addressed to the Chairman of the Medical Board not later than 12th July, 1930.

By order.

FRANK G. HAZELL, General Superintendent and Secretary.
23rd June, 1930.

Warrington Infirmary and Dispensary.

ANÆSTHETIST.

The Board of Management invite applications for the above post.

Attendance at the Hospital is required on six days per week in the mornings up to noon.

The Board are prepared to form a rota of two or three Medical Practitioners if it is impossible for them to secure a candidate for the full six days.

An honorarium of £150 will be paid or, if the rota is made this sum will be proportionately divided.

As this is a part-time post the position may appeal to those Practitioners who are holding other part-time posts or studying for higher degrees.

Applications should be sent in to the undersigned at once stating qualifications and also the number of days they wish to attend. By order.

HENRY L. BOOT, Superintendent and Secretary.
23rd June, 1930.

County Council of Middlesex.

ASSISTANT MEDICAL OFFICER.

The County Council invites applications for the post of an Assistant Medical Officer in the Public Health and School Medical Department. Applicants must be duly qualified registered Medical Practitioners.

The duties of the post are the medical inspection of school-children, the supervision of treatment of minor ailments, the carrying out of work under the Maternity and Child Welfare Scheme, and such other duties as may be required by the Council. The officer appointed must devote whole time to the duties of the post, will act under the supervision and control of the County Medical Officer of Health, and must reside in such district as may be required by the County Council.

Salary at the rate of £600 per annum, rising after two years' service by yearly increments of £30 to £750 (no bonus). Reasonable travelling expenses allowed.

The successful candidate will be required to contribute to the County Council's Superannuation Fund and to pass such medical examination as the County Council may direct.

The appointment will be during the pleasure of the Council, and subject to one month's notice on either side.

Applications, stating (1) age, (2) qualifications, and (3) previous experience, together with copies of not more than three recent testimonials, must be received by the undersigned not later than 12th July, 1930. No special application forms are provided. Envelopes must be endorsed "Assistant Medical Officer."

Canvassing, directly or indirectly, will be a disqualification.

ERNEST S. W. HART, Clerk of the County Council.

Middlesex Guildhall, Westminster, S.W.1, 24th June, 1930.

The General Infirmary at Leeds.

(627 Beds.)

(1) RESIDENT AURAL OFFICER.
(2) OPHTHALMIC AND AURAL HOUSE SURGEON.
(3) ASSISTANT RECEIVING ROOM OFFICER.
(4) ORTHOPÆDIC HOUSE SURGEON.

Applications are invited for the above posts, with the undermentioned salaries:—

(1) £150 per annum. (3) £60 per annum.
(2) £50 per annum. (4) Nil.

All the above with board, residence, and laundry.

The appointment (1) is for twelve months; the others for six months subject to renewal. Candidates must be legally qualified and registered.

Applications, marked "Appointments," with copies of testimonials, to be addressed to the undersigned on or before the 4th July, 1930. H. KINGSLEY PEARCE, General Manager.

28th June, 1930.

Administrative County of Essex.

MALE ASSISTANT
COUNTY MEDICAL OFFICER OF HEALTH.

The County Council of the Administrative County of Essex invite applications for the above post from registered Medical Practitioners specially qualified in the treatment of Tuberculosis, School Medical Inspection, and Maternity and Child Welfare, holding a Diploma of Public Health, and not over forty-five years of age.

Preference will be given to candidates who have had at least three years' experience in Public Health work subsequent to their medical qualification. The salary attached to the appointment will commence at £500 to £600 per annum, according to experience, and will rise, subject to satisfactory service, to £700 per annum. An allowance for travelling will be made. The person appointed will be required to devote his whole time to the service of the Council, and to perform such duties and to furnish such advice and assistance appertaining to his office as may be required, and to reside in such district of the County as the Council may decide. The appointment will be subject to three months' notice on either side.

Applications on the prescribed form, obtainable from the undersigned, and accompanied by copies of not more than three testimonials, which will not be returned, should be addressed to me and delivered at the Shire Hall, Chelmsford, not later than 10 A.M. on Monday, the 14th July, 1930.

JOHN H. GOOLD, Clerk of the County Council.

Shire Hall, Chelmsford, 24th June, 1930.

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2. WEST OF ENGLAND.—In a small pleasantly situated town amidst beautiful surrounding country, old-estab. PRACTICE. Income nearly £1350 p.a., including panel of 900. Visits 5s. to 21s. Little Midwifery. Very attractive house in own grounds of 2 acres, containing 3 large professional rooms (separate entrance), 2 reception, 5 bedrooms, bathroom, &c. Vendor's freehold. Price £2400 (£1800 can remain on mortgage). Premium £2000. Good society, sport, &c.
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7. NORTH LONDON.—Old-estab. good mixed-class PRACTICE, producing about £1600 p.a. Panel of 1000, and appts. worth about £300 p.a. Fees from 2s. 6d. No Midwifery, but scope if desired. Moderate expenses. Good corner house, with 2 reception, 5 bedrooms, &c. Small garden. Price for freehold £1750, or might be rented.
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9. ESSEX.—Unopposed PRACTICE in very pleasant agricultural district, averaging £872 p.a., including panel of nearly 500, and appts. worth £140. Fees 3s. 6d. to 10s. 6d. Midwifery 3 to 6 gns., about 12 cases. Commodious house with 2 reception, 5 bedrooms, and good professional accommodation. Large garden, garage. Rent on lease £60. Good sport and schools within reach. Premium 1½ years' purchase.
10. LANCS.—Pleasant town near open country.—Well-estab. middle- and better-class PRACTICE. Cash receipts last year over £980, including panel of 900. Visits 3s. 6d. to 7s. 6d., medicine extra. Midwifery 2 to 10 gns., about 20 cases. Suitable house, with 2 reception, 4 bedrooms, &c. Price for leasehold £1100, £600 on mortgage. Premium 1½ years' purchase, part by instalments.
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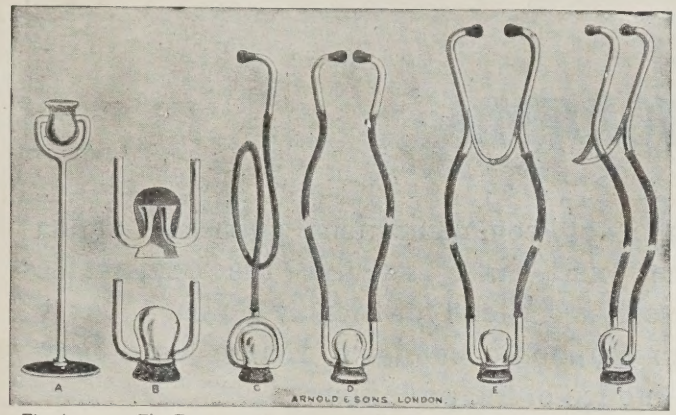

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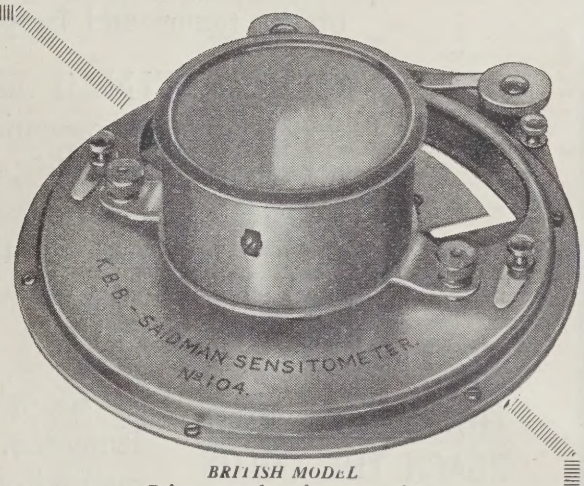

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